

# Kansas State Agricultural College

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## CATALOGUE

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FIFTY-FIRST SESSION  
1913-1914



ANNOUNCEMENTS  
1914-1915

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MANHATTAN

THE KANSAS INDUSTRIALIST, VOL. XL, No. 41.

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TOPEKA. 1914.

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## The Board of Administration

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THE HON. ED. T. HACKNEY, *President*..... Term expires 1917  
Wellington, Sumner county.  
THE HON. E. W. HOCH..... Term expires 1915  
Marion, Marion county.  
THE HON. (Mrs.) CORA G. LEWIS..... Term expires 1917  
Kinsley, Edwards county.

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D. M. BOWEN, *Secretary*.  
Pittsburg, Crawford county.

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## Administrative Officers

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President ..... HENRY JACKSON WATERS  
Dean of the Division of Agriculture and  
Director of the Agricultural Experiment  
Station ..... WILLIAM M JARDINE  
Acting Dean of the Division of Mechanic  
Arts and Director of the Engineering  
Experiment Station ..... ANDREY A. POTTER  
Dean of the Division of General Science.. J. T. WILLARD  
Dean of the Division of Home Economics.. MRS. MARY P. VAN ZILE  
Dean of the College..... CLARK M. BRINK  
Dean of the Division of College Extension, J. H. MILLER  
Director of the Summer School..... E. L. HOLTON  
Principal of the School of Agriculture... H. L. KENT  
Registrar ..... MISS JESSIE MCD. MACHIR  
Financial Secretary and Purchasing Agent, J. T. LARDNER  
Librarian ..... ARTHUR B. SMITH  
Custodian ..... G. F. WAGNER

### Standing Committees of the Faculty

ADMISSION: Jessie McD. Machir, J. V. Cortelyou, B. L. Remick, G. S. Lowman, W. A. Lippincott, Bessie W. Birdsall, Carl Ostrom, E. V. Floyd.

ADVANCED CREDIT: *College*.—J. T. Willard, R. R. Price, J. W. Searson, Ula M. Dow, A. A. Potter, W. H. Andrews, L. E. Call.

*School of Agriculture*.—H. L. Kent, E. L. Holton, Ada Rice, E. V. James, W. T. Stratton.

CATALOGUE: J. V. Cortelyou, H. F. Roberts, J. W. Searson.

COLLEGE RULES: R. R. Price, J. E. Kammeyer, J. T. Willard, J. D. Walters.

"COLLEGE STUDIES": J. O. Hamilton, A. A. Potter, L. E. Call, H. F. Roberts, A. B. Smith.

DISCIPLINE: R. R. Price, Albert Dickens, J. W. Searson.

GRADUATE STUDY: W. M. Jardine, J. V. Cortelyou, A. A. Potter, H. F. Roberts, Mary P. Van Zile.

PUBLIC EXERCISES: J. E. Kammeyer, J. V. Cortelyou, Olof Valley.

SCHEDULE OF CLASSES: J. T. Willard, A. E. White.

STUDENT AFFAIRS: J. O. Hamilton, J. W. Searson, E. L. Holton, Mary P. Van Zile, L. E. Conrad.

STUDENT ASSEMBLY: J. E. Kammeyer.

STUDENT HEALTH: L. E. Conrad, L. D. Bushnell, L. W. Goss.

1914.							1915.																		
JULY.							JANUARY.							JULY.											
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## The College Calendar

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### 1914

SEPT. 14, Monday.—Faculty meeting at nine A. M.  
SEPT. 14, Monday.—Meeting of assigners at ten A. M.  
SEPT. 14, Monday.—Assignment of students begins at one-thirty P. M.  
SEPT. 14, Monday.—Admission of new students at one-thirty P. M.  
SEPT. 17, Thursday.—Assignment of students closes at five P. M.  
SEPT. 17, Thursday.—Short course for housekeepers begins  
SEPT. 18, Friday.—All classes meet according to schedule  
SEPT. 18, Friday.—Opening convocation at ten A. M.  
OCT. 10, Saturday.—Scholarship deficiency reports due  
OCT. 31, Saturday.—Scholarship deficiency reports due  
NOV. 26 to 28, Thursday to Saturday.—Thanksgiving vacation  
DEC. 5, Saturday.—Examinations to remove conditions  
DEC. 11 to 18, Friday to Friday.—Examinations at close of term  
DEC. 18, Friday.—Fall term closes at eleven A. M.  
DEC. 14, Monday.—Assignment of students for winter term begins at nine A. M.

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### 1915

JAN. 4, Monday.—Admission of new students at nine A. M.  
JAN. 5, Tuesday.—Assignment of students closes at five P. M.  
JAN. 5, Tuesday.—Short courses in agriculture and dairying begin  
JAN. 6, Wednesday.—All classes meet according to schedule  
JAN. 30, Saturday.—Scholarship deficiency reports due  
FEB. 20, Saturday.—Scholarship deficiency reports due  
MAR. 13, Saturday.—Examinations to remove conditions  
MAR. 17, Wednesday.—Short courses in agriculture and dairying close  
MAR. 19 to 26, Friday to Friday.—Examinations at close of term  
MAR. 26, Friday.—Winter term closes at eleven A. M.  
MAR. 22, Monday.—Assignment of students for the spring term begins at nine A. M.

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MAR. 29, Monday.—Admission of new students at nine A. M.  
MAR. 30, Tuesday.—Assignment of students closes at five P. M.  
MAR. 31, Wednesday.—All classes meet according to schedule  
APR. 17, Saturday.—Scholarship deficiency reports due  
MAY 8, Saturday.—Scholarship deficiency reports due  
JUNE 5, Saturday.—Examinations to remove conditions  
JUNE 9 to 16, Wednesday to Wednesday.—Examinations at close of term  
JUNE 13 to 17, Sunday to Thursday.—Exercises of Commencement Week  
JUNE 17 to JULY 29, Thursday to Thursday.—Summer School in session

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SEPT. 13, Monday.—Assignment of students begins at one-thirty P. M.  
SEPT. 16, Thursday.—Assignment of students closes  
SEPT. 17, Friday.—All classes meet according to schedule

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Students must be present the very first day of each term or render a reasonable excuse. Failure to take out an assignment is not accepted as an excuse for absence from classes.

## The Board of Instruction

HENRY JACKSON WATERS, B. S. A., LL. D.,

*President of the College.*

B. S. A., University of Missouri, 1886; Assistant Secretary, Missouri State Board of Agriculture, 1886-1888; Assistant in Agriculture to Missouri Experiment Station, 1888-1891; Professor of Agriculture, Pennsylvania State College, and Agriculturist, Pennsylvania Experiment Station, 1892-1895; Instructor in Animal Nutrition, Graduate School of Agriculture, University of Ohio, 1902; Director Missouri State Agricultural Exhibit, World's Fair, St. Louis, 1903-1904; Student at the Universities of Leipzig and Zurich, 1904-1905; Instructor in Animal Nutrition, Graduate School of Agriculture, University of Illinois, 1906; President Missouri State Board of Agriculture, 1908-1909; Dean of the College of Agriculture, Director of the Experiment Station, and Professor of Agriculture, University of Missouri, 1895-1909; President, Kansas State Teachers' Association, 1911-1912; LL. D., New Hampshire State College, 1918; President, Kansas State Agricultural College, 1909—.

Office\* A 30; Res. 2 Park Road.

JOHN DANIEL WALTERS, D. A.,

*Professor of Architecture and Drawing.*

Student, High School, Bucheggberg, Switzerland, 1860-1863; Student, College of Solothurn, Switzerland, 1863-1867; Instructor, Agricultural Experiment Station, Klingenberg, Switzerland, 1865-1866; Student, University of Bern, 1868; Instructor in Industrial Art, Kansas State Agricultural College, 1876-1885; M. S., *ibid.*, 1883; Professor of Industrial Art and Design, *ibid.*, 1885-1904; D. A., *ibid.*, 1908; Professor of Architecture and Drawing, *ibid.*, 1904—.

Office E 56; Res. 508 Bluemont Ave.

JULIUS TERRASS WILLARD, D. Sc.,

*Dean of the Division of General Science, Chemist of the Experiment Stations, Professor of Chemistry.*

B. S., Kansas State Agricultural College, 1883; Assistant in Chemistry, *ibid.*, 1883-1887; M. S., *ibid.*, 1886; Graduate Student, Johns Hopkins University, 1887-1888; Assistant Chemist, Kansas Experiment Station, 1888-1897; Assistant Professor of Chemistry, Kansas State Agricultural College, 1890-1896; Associate Professor of Chemistry, *ibid.*, 1896-1897; Chemist, Kansas Experiment Station, 1897—; Professor of Applied Chemistry, Kansas State Agricultural College, 1897-1901; Director, Kansas Experiment Station, 1900-1906; Vice Director, *ibid.*, 1907—; Professor of Chemistry, Kansas State Agricultural College, 1901—; D. Sc., *ibid.*, 1908; Dean of the Division of General Science, *ibid.*, 1909—; Chemist, Engineering Experiment Station, *ibid.*, 1910—.

Office C 30; Res. 1725 Poyntz Ave.

BENJAMIN LUCE REMICK, PH. M.,

*Professor of Mathematics.*

Ph. B., Cornell College (Iowa), 1889; Instructor, Cornell College Academy, 1889-1892; Ph. M., Cornell College, 1892; Graduate Student, Johns Hopkins University, 1892-1898; Instructor, Northwestern University Academy, 1893-1894; Graduate Student, University of Chicago, 1894-1895; Professor of Mathematics, University of the Pacific, 1895-1896; Graduate Student, University of Chicago, 1896-1898; Associate, Bradley Institute (Peoria, Illinois), 1898-1900; Professor of Mathematics, Kansas State Agricultural College, 1900—.

Office A 71; Res. 613 Houston St.

\* Buildings are designated by letters, as follows:

A—Anderson Hall (Main).	L—Domestic Science and Art Hall.
Ag—Agricultural Hall.	M—Auditorium.
C—Denison Hall.	N—Nichols Gymnasium.
D—Dairy Hall.	R—Farm Mechanics Hall (Old Armory).
E—Mechanical Engineering Hall.	S—Engineering Shops.
F—Fairchild Hall (Library).	V—Veterinary Hall.
G—Agricultural Hall (Old).	W—Chemistry Annex.
H—Horticultural Hall.	X—Horticultural Laboratory.
K—Kedzie Hall (Printing).	

## HERBERT FULLER ROBERTS, M. S.,

*Professor of Botany.*

A. B., University of Kansas, 1891; LL. B., Northwestern University Law School (Chicago), 1893; Admission to the Bar, Supreme Court of Illinois, 1893; Assistant in Law Offices, Kansas City, Missouri, 1893-1894; Graduate Student in Biology, Kansas State Agricultural College, 1896-1898; M. S., *ibid.*, 1898; Graduate Student, University of Chicago, 1898-1899; Instructor in Botany, Washington University (St. Louis), 1899-1901; Professor of Botany, Kansas State Agricultural College, 1901—.

Office H 58; Res. 1920 Poyntz Ave.

WILLIAM ARCH MCKEEVER,<sup>1</sup> PH. M.,*Professor of Philosophy.*

A. B., Campbell College, 1893; Principal, Holton Schools, 1894-1896; A. M., University of Kansas, 1898; Superintendent, Smith Center Public Schools, 1898-1900; Assistant Professor of English and Philosophy, Kansas State Agricultural College, 1900-1901; Ph. M., University of Chicago, 1904; Graduate Student, Harvard University Summer School, 1904; Professor of Philosophy, Kansas State Agricultural College, 1901 - October 1, 1913.

## ALBERT DICKENS, M. S.,

*Professor of Horticulture.*

B. S., Kansas State Agricultural College, 1893; Foreman, Munger Orchards, Eureka, 1895; State Teacher's Certificate, 1895; Instructor, Ellinwood High School, 1897-1898; Teacher's Life Certificate, 1898; Assistant in Horticulture, Kansas State Agricultural College, 1899-1901; M. S., *ibid.*, 1901; Acting Professor of Horticulture, *ibid.*, 1901-1902; Professor of Horticulture, *ibid.*, 1902—.

Office H 30; Res. 509 N. Manhattan Ave.

## CLARK MILLS BRINK, PH. D.,

*Dean of the College, Assistant to the President, Professor of English Literature.*

A. B., University of Rochester, 1879; Graduate, Rochester Theological Seminary, 1882; Pastor, First Baptist Church, Des Moines, Iowa, 1882-1887; Fellow and Graduate Student, New York University, 1888-1892; Instructor in Rhetoric and Oratory, Brown University, 1892-1895; A. M., University of Rochester, 1893; Ph. D., New York University, 1894; Professor of English and History, Kalamazoo College, 1895-1901; Graduate Student, University of Chicago, Summer, 1900; Graduate Student, Harvard University, 1901-1902; Professor of English, Kansas State Agricultural College, 1902-1911; Assistant to the President, *ibid.*, 1908—; Dean of Science, *ibid.*, 1908-1909; Dean of the College, *ibid.*, 1909—; Professor of English Literature, *ibid.*, 1911—.

Office A 61; Res. 9 Park Road.

## RALPH RAY PRICE, A. M.,

*Professor of History and Civics.*

A. B., Baker University, 1896; Graduate Student, University of Kansas, 1896-1898; A. M., *ibid.*, 1898; Assistant in History, *ibid.*, 1897-1900; Graduate Student, University of Chicago, Summer, 1899; Instructor in History and Civics, Lawrence High School, 1898-1901; Graduate Student, University of Wisconsin, Summer, 1901; Instructor in History and Civics, Ishpeming (Michigan) High School, 1901-1902; Graduate Student, Cornell University, Summer, 1902; Instructor in History and Civics, and Assistant Principal, Rockford (Illinois) High School, 1902-1903; Graduate Student, University of Michigan Law School, Summer, 1909; Professor of American History and Government, University of Kansas, Summer, 1911; Professor of History and Civics, Kansas State Agricultural College, 1903—.

Office F 57; Res. 826 Houston St.

## JULIUS ERNEST KAMMEYER, A. M., LL. D.,

*Professor of Economics.*

A. B., Central Wesleyan College, 1886; Instructor, Public Schools, 1886-1893; A. M., Central Wesleyan College, 1889; Instructor in History and Civics, Kansas City (Kansas) High School, 1893-1897; Vice Principal and Instructor in Economics, *ibid.*, 1897-1903; Professor of Oratory, Kansas State Agricultural College, 1903-1904; Graduate Student, University of Chicago, Summer, 1910; LL. D., Kansas City University, 1912; Professor of Economics, Kansas State Agricultural College, 1904—.

Office A 52; Res. 901 Bluemont Ave.

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1. Resigned.

## JOHN VANZANDT CORTELYOU, PH. D.,

*Professor of German.*

A. B., University of Nebraska, 1897; Assistant Principal, Humboldt (Nebraska) High School, 1897-1898; Principal, *ibid.*, 1898-1899; A. M., University of Nebraska, 1901; Graduate Student, University of Heidelberg, Germany, 1901-1904; Research Work, British Museum and Bibliotheque Nationale (Paris), Summer, 1903; Ph. D., University of Heidelberg, 1904; Professor of German, Kansas State Agricultural College, 1904—.  
Office N 59; Res. 5 Park Road.

## OLOF VALLEY, B. M.,

*Professor of Music.*

Student, Teknologiska Institutet, Stockholm, Sweden, 1886-1888; Engineering Profession, Chicago, 1888-1892; Pupil of Signor Carpi, 1892-1893, Albert B. Ruff, 1893-1897; Soloist with American Union Swedish Singers on European Concert Tour, 1897; Pupil of Williams Nelson Burritt, 1898-1900; Concert and Oratorio Artist, 1900—; Pupil of Max Heinrich, 1900-1901; B. M., Chicago Conservatory of Music, 1902; Instructor and Concert Artist, *ibid.*, 1903-1904; Professor of Music, Kansas State Agricultural College, 1904—.  
Office M 30; Res. 225 N. Fourteenth St.

## FRANCIS SIEGEL SCHOENLEBER, D. V. S.,

*Professor of Veterinary Medicine.*

B. S. A., Iowa State College, 1885; Assistant in Agriculture, *ibid.*, 1885-1888; M. S. A., *ibid.*, 1887; Associate Editor, *Orange Judd Farmer*, Chicago, 1888-1890; D. V. S., Chicago Veterinary College, 1890; Private Veterinary Practice, 1890-1896; Dean, McKillup Veterinary College, Chicago, 1896-1899; and 1901-1905; M. D., Harvey Medical College, Chicago, 1901; M. D., National Medical University, Chicago, 1901; Private Human Practice, 1901-1908; Professor of Veterinary Medicine, Kansas State Agricultural College, 1905—.  
Office V 30; Res. 508 Houston St.

## JOHN HAROLD MILLER, A. M.,

*Dean of the Division of College Extension.*

A. B., Central Normal College (Danville, Indiana), 1882; President, Campbell College, 1882-1888; with D. C. Heath and Company, 1888-1890; Publisher *Northwestern Monthly*, Lincoln, Nebraska, 1890-1900; Principal State Normal School, Cheney, Washington, 1900-1902; Editor and Publisher, Holton (Kansas) *Tribune*, 1902-1905; Superintendent of Agricultural Extension, Kansas State Agricultural College, 1905-1911; Director of College Extension, *ibid.*, 1911-1912; Dean of the Division of College Extension, *ibid.*, 1912—.  
Office A 33; Res. 1610 Leavenworth St.

## JOHN ORR HAMILTON, B. S.,

*Professor of Physics, in Charge of Electrical Engineering.*

Student, Monmouth College, 1888-1890; Superintendent, Roseville (Illinois) Public Schools, 1894-1898; B. S., University of Chicago, 1900; Instructor in Science, Mount Barbara Military Academy (Salina), 1900-1901; Assistant in Physics, Kansas State Agricultural College, 1901-1908; Assistant Professor in Physics, *ibid.*, 1903-1908; Professor of Physics, *ibid.*, 1908—; in Charge of Electrical Engineering, *ibid.*, January 1, 1913—.  
Office O 57; Res. 6 Park Road.

## MARY PIERCE VAN ZILE,

*Dean of the Division of Home Economics, Professor of Domestic Science.*

Instructor, Winfield (Iowa) Schools, 1888-1889; Student, Kansas State Agricultural College, 1889-1891; Principal, Wayland (Iowa) High School, 1891-1892; Teacher's Diploma, Iowa State College, 1902; Instructor in Domestic Science, *ibid.*, 1902-1903; Student, Graduate School of Domestic Science, University of Illinois, Summer, 1903; Domestic Science Lecturer and Demonstrator at Chautauquas, Summers of 1903-1905; Instructor in Domestic Science and Art, Township High School, Chicago, 1903-1908; Professor of Domestic Science, Kansas State Agricultural College, 1908—; Dean of Women, *ibid.*, 1908-1913; Dean of the Division of Home Economics, 1913—.  
Office L 30; Res. 1322 Fremont St.

## LOWELL EDWIN CONRAD, M. S.,

*Professor of Civil Engineering.*

Chairman, Union Pacific Railroad Company, 1899; Chairman, Illinois Central Railroad Company, 1900; Levelman, Vicksburg National Military Park, 1900-1901; Field Draftsman, Choctaw, Oklahoma and Gulf Railroad Company, 1901; Instrument Man, Mexican Central Railway Company, 1902-1903; B. S., Cornell College (Iowa), 1904; Inspector and Instrument man on Sewer Construction, Centralia, Illinois, 1904; Assistant Engineer on Construction, Gulf Terminus of the Tehauntepec Route, Mexico, 1905-1906; C. E., Cornell College (Iowa), 1906; Instructor and Graduate Student in Civil Engineering, Lehigh University, 1906-1908; M. S., *ibid.*, 1908; Assistant Professor of Civil Engineering, Kansas State Agricultural College, 1908-1909; Professor of Civil Engineering, *ibid.*, 1909—.

Office E 31; Res. 317 N. Seventeenth St.

## CHARLES ANDERSON SCOTT, B. S.,

*Kansas State Forester.*

B. S., Kansas State Agricultural College, 1901; Forest Expert, United States Forest Service, 1901-1904; Graduate Student, Yale University Forest School, 1904-1905; Forest Supervisor, United States Forest Service, 1905-1907; Special Lecturer on Forestry Subjects, University of Nebraska, Winters, 1906 and 1907; Professor of Forestry, Iowa State College, 1908-1910; Kansas State Forester, Kansas State Agricultural College, 1910—.

Office H 28; Res. 311 N. Eighteenth St.

## LESLIE ARTHUR FITZ, B. S.,

*Professor of Milling Industry.*

B. S., Kansas State Agricultural College, 1902; Grain Investigation, United States Department of Agriculture, 1902-1906; Office of Grain Standardization, *ibid.*, 1906-1910; in Charge of Department of Milling Industry, Kansas State Agricultural College, 1910-1912; Professor of Milling Industry, *ibid.*, 1912—.

Office Ag 39; Res. 1014 Houston St.

## EDWIN LEE HOLTON, A. B.,

*Professor of Education, Director of the Summer School.*

Graduate, Indiana State Normal School, 1900; Principal, Township Consolidated Schools, Madison County, Indiana, 1900-1902; A. B., University of Indiana, 1904; Graduate Student, *ibid.*, Winter and Spring Terms, 1904; Superintendent City Schools, Holton, Kansas, 1904-1906; Superintendent City Schools, Noblesville, Indiana, 1906-1908; Graduate Student, Columbia University, 1908-1910; Supervisor Industrial Schools, New York City, 1909-1910; Professor of Rural Education, Kansas State Agricultural College, 1910-1913; Director of the Summer School, *ibid.*, 1910—; Professor of Education, *ibid.*, 1913—.

Office A 32; Res. 217 Park Road.

## ANDREY ABRAHAM POTTER, S. B.,

*Professor of Steam and Gas Engineering; Acting Dean of the Division of Mechanic Arts; Acting Director of Engineering Experiment Station.*

S. B., Massachusetts Institute of Technology, 1903; Engineer in Experimental Steam Turbine Department, General Electric Company, Schenectady, New York, 1903-1905; Graduate Student, Columbia University, Summer Session, 1908; with General Electric Company, Lynn, Massachusetts, Summer, 1913; Assistant Professor of Mechanical Engineering, Kansas State Agricultural College, 1905-1910; Professor of Steam and Gas Engineering, *ibid.*, 1910—; in Charge of Mechanical Engineering, *ibid.*, 1910—; Acting Dean of the Division of Mechanic Arts, and Acting Director of Engineering Experiment Station, *ibid.*, 1913—.

Office E 30; Res. 1328 Fremont St.

## ROY ANDREW SEATON, M. S.,

*Professor of Applied Mechanics and Machine Design.*

B. S., Kansas State Agricultural College, 1904; Assistant in Mathematics, *ibid.*, 1904-1906; Assistant Professor, *ibid.*, 1906; Graduate Student, University of Wisconsin, Summer Session, 1908; Instructor in Mechanical Engineering, Kansas State Agricultural College, 1907-1909; Assistant Professor of Mechanical Engineering, *ibid.*, 1909-1910; M. S., *ibid.*, 1910; Graduate Student, Massachusetts Institute of Technology, 1910-1911; S. B., *ibid.*, 1911; in Turbine Drafting Department, General Electric Company, Lynn, Massachusetts, 1911-1912; Professor of Applied Mechanics and Hydraulics, Kansas State Agricultural College, 1910-1914; Professor of Applied Mechanics and Machine Design, *ibid.*, 1914—.

Office S 61; Res. 722 Humboldt St.



## WILLIAM M JARDINE, B. S. A.,

*Dean of the Division of Agriculture, Director of the Agricultural Experiment Station.*

B. S. A., Utah Agricultural College, 1904; Instructor in Agronomy, *ibid.*, 1904-1905; Manager, Utah Arid Farming Company, Utah, 1905; Assistant Professor of Agronomy, Utah Agricultural College, 1905; Student, Graduate School of Agriculture, University of Illinois, 1906; Professor of Agronomy, Utah Agricultural College, 1906-1907; Assistant Cerealist, United States Department of Agriculture, 1907-1910; Professor of Agronomy, Kansas State Agricultural College, 1910-1913; Instructor in Field Crops, Graduate School of Agriculture, Michigan Agricultural College, 1912; Acting Dean of the Division of Agriculture, and Acting Director of the Agricultural Experiment Station, *ibid.*, January 1 - September 1, 1913; Dean of the Division of Agriculture, and Director of the Agricultural Experiment Station, *ibid.*, 1913—.

Office Ag 33; Res. 1020 Houston St.

## JAMES WILLIAM SEARSON, A. M.,

*Professor of the English Language.*

Principal, Weeping Water (Nebraska) High School, 1894-1895; Instructor and Lecturer in State and County Teachers' Institutes, 1895—; A. B., University of Nebraska, 1896; Fellow in History, *ibid.*, 1896-1898; A. M., *ibid.*, 1899; Superintendent, Wahoo (Nebraska) Schools, 1899-1905; Professor of English and Rhetoric, Nebraska State Normal School, (Peru), 1905-1910; Associate Professor of English, Kansas State Agricultural College, 1910-1911; Professor of the English Language, *ibid.*, 1911—.

Office K 37; Res. 1320 Fremont St.

## OLLIE EZEKIEL REED, M. S.,

*Professor of Dairy Husbandry.*

B. S., College of Agriculture, University of Missouri, 1903; Assistant in Dairy Husbandry, *ibid.*, 1903-1909; Instructor in Milk Production, Purdue University, 1909-1910; M. S., University of Missouri, 1910; Assistant Professor in Charge of Department of Dairy Husbandry, Kansas State Agricultural College, 1910-1911; Professor of Dairy Husbandry, *ibid.*, 1911—.

Office D 30; Res. 1221 Laramie St.

## GUY SUMNER LOWMAN, B. P. E.,

*Professor of Physical Education; Director of Physical Training.*

B. Di., Iowa State Normal School, 1903; B. P. E., International School of Physical Training, Springfield, Massachusetts, 1905; Director of Physical Training, Brookline (Massachusetts) High School, 1905-1907; Graduate Student, Harvard Summer School of Physical Education, Summer, 1907; Director of Physical Education, Warrensburg (Missouri) State Normal School, 1907-1908; Instructor in Physical Education, University of Missouri, 1908-1910; Professor of Physical Training and Director of Athletics, University of Alabama, 1910-1911; Professor of Physical Education and Director of Physical Training, Kansas State Agricultural College, 1911—.

Office N 37; Res. 4 Park Road.

## ARTHUR BOURNE SMITH, B. L. S.,

*Librarian.*

Librarian in Charge, Genesee Wesleyan Seminary, New York, 1892-1895; Principal, Smithboro (New York) Public Schools, 1895-1896; Assistant in Library, Wesleyan University, 1896-1900; Ph. B., Wesleyan University, 1900; Library Assistant, University of Illinois, 1900-1902; B. L. S., *ibid.*, 1902; Assistant Editor, *Cumulative Book Index United States Catalogue*, and *Readers' Guide to Periodical Literature*, June-September, 1902; Lecturer on Bibliography, University of California, 1903; Head of Order Department of Library, *ibid.*, 1903-June, 1911; Head of Accessions Division of Library, *ibid.*, July-August, 1911; Instructor in Summer School, *ibid.*, 1906 and 1907; Librarian, Kansas State Agricultural College, 1911—.

Office F 32; Res. 1020 Poyntz Ave.

## WILLIAM ADAMS LIPPINCOTT, B. S.,

*Professor of Poultry Husbandry.*

A. B., Illinois College, 1903; Secretary, Young Men's Christian Association, Chicago; 1903-1904; Student, Chicago Theological Seminary, 1904-1906; Poultry Farming, 1906; Graduate Student, Cornell University, 1906-1907; Superintendent of Poultry Farm, Iowa State College, 1907-1908; Student Assistant in Poultry, *ibid.*, 1908-1910; Student, Graduate School of Agriculture, Ames, Iowa, Summer, 1910; Assistant in Charge of Poultry, Iowa State College, 1910-1911; B. S., *ibid.*, 1911; Assistant Professor of Animal Husbandry in Charge of Poultry, *ibid.*, 1911; Professor of Poultry Husbandry, Kansas State Agricultural College, 1912—.

Office Ag 101; Res. 710 Humboldt St.

WILBER ANDREW COCHEL, A. B., B. S.,

*Professor of Animal Husbandry.*

A. B., University of Missouri, 1897; Assistant in Agronomy Department, St. Louis World's Fair, 1903; in Charge of Holsteins in Dairy Test, *ibid.*, 1904; B. S., University of Missouri, 1905; Fellow in Animal Husbandry, *ibid.*, 1905-1906; Assistant in Animal Husbandry, Purdue University, 1906-1907; Associate in Animal Husbandry, *ibid.*, 1907-1909; Professor of Animal Husbandry, Pennsylvania State College, 1909-1912; Professor of Animal Husbandry, Kansas State Agricultural College, 1912—  
Office Ag 8; Res. 209 N. Fourteenth St.

LELAND DAVID BUSHNELL, B. S.,

*Professor of Bacteriology.*

B. S., Michigan Agricultural College, 1905; Assistant in Bacteriology, *ibid.*, 1906-1907; Expert in Dairy Bacteriology, Bureau of Animal Industry, University of Wisconsin, 1908-1909; Assistant in Bacteriology, Kansas State Agricultural College, 1909-1910; Instructor in Bacteriology, *ibid.*, 1910-1911; Assistant Professor in Charge of Department of Bacteriology, *ibid.*, 1911-1912; Professor of Bacteriology, *ibid.*, 1912—  
Office V 54; Res. 1414 Humboldt St.

BESSIE WEBB BIRDSALL,

*Professor of Domestic Art.*

Student, Drexel Institute, Philadelphia, Pennsylvania, 1900-1901; Instructor in Domestic Art, Hill School, Florence, Massachusetts, 1901-1902; Graduate, Normal Domestic Art Course, Drexel Institute, 1903; Head of Department of Domestic Art, Winthrop State Normal and Industrial College, Rock Hill, South Carolina, 1903-1912; Instructor in Domestic Art, Vacation School, Buffalo, New York, Summer, 1906; Graduate Student, Teachers' College, Columbia University, Summers, 1911, 1912; Professor of Domestic Art, Kansas State Agricultural College, 1912—  
Office L 55; Res. 113 S. Eighth St.

ROY ALISON HILL, Second Lieutenant, Seventh United States Infantry,

*Professor of Military Science and Tactics; Commandant of Cadets.*

Cadet, United States Military Academy, 1904-1908; Second Lieutenant, Seventh United States Infantry, 1908—; Professor of Military Science and Tactics, Commandant of Cadets, Kansas State Agricultural College, February 15, 1913—  
Office N 29; Res. 113 S. Eighth St.

LELAND EVERETT CALL, M. S.,

*Professor of Agronomy.*

B. S. (Agr.), Ohio State University, 1906; Teaching Fellow, *ibid.*, 1906-1907; Assistant in Agronomy, Kansas State Agricultural College, 1907-1908; Assistant Professor of Soils, *ibid.*, 1908-1911; Associate Professor of Soils, *ibid.*, 1911-1913; Graduate Student, Ohio State University, 1912; M. S., *ibid.*, 1912; Professor of Agronomy, Kansas State Agricultural College, 1913—  
Office Ag 58; Res. 609 N. Ninth St.

GEORGE ADAM DEAN, M. S.,

*Professor of Entomology.*

B. S., Kansas State Agricultural College, 1895; State Teacher's Certificate, 1898; Principal, Highland Park (Topeka) Public School, 1898-1902; Assistant in Entomology, Kansas State Agricultural College, 1902-1905; M. S., *ibid.*, 1905; Instructor in Entomology, *ibid.*, 1905-1907; Assistant Professor of Entomology, *ibid.*, 1907-1912; Associate Professor of Entomology, *ibid.*, 1912-1913; Professor of Entomology, *ibid.*, 1913—  
Office F 52; Res. 511 Juliette Ave.

ROBERT KIRKLAND NABOURS, Ph. D.,

*Professor of Zoölogy; Curator of the Natural History Museum.*

Ed. B., School of Education, University of Chicago, 1905; Teacher of Natural History, and Assistant Curator of the Museum, *ibid.*, 1905-1909; Graduate Student in Zoölogy, University of Chicago, 1907-1910; Assistant in Zoölogy, *ibid.*, 1909-1910; Instructor in Zoölogy, Kansas State Agricultural College, 1910-1911; Ph. D., University of Chicago, 1911; Assistant Professor of Zoölogy, Kansas State Agricultural College, 1911-1913; Professor of Zoölogy, *ibid.*, 1913—  
Office F 54; Res. 714 Poyntz Ave.

## LEONARD WHITTLESEY GOSS, D. V. M.,

*Professor of Pathology.*

D. V. M., Ohio State University, 1905; Assistant in Veterinary Science, Kansas State Agricultural College, 1905-1907; Graduate Student, University of Michigan, Summer, 1906; Instructor in Veterinary Science, Kansas State Agricultural College, 1907-1909; Graduate Student, Tierärztliche Hochschule, Berlin, Germany, 1911-1912; Graduate Student, University of Berlin, 1912; Assistant Professor of Veterinary Medicine, Kansas State Agricultural College, 1909-1913; Professor of Pathology, *ibid.*, December 1, 1913—.

Office V 56; Res. 723 Houston St.

## RALPH RALPH DYKSTRA, D. V. M.,

*Professor of Surgery.*

Registered Pharmacist in Iowa, 1900; D. V. M., Iowa State College, 1905; Assistant Professor of Anatomy, Obstetrics, and Clinics, *ibid.*, 1905-1907; Associate Professor of Anatomy, Obstetrics, and Clinics, *ibid.*, 1907-1909; Professor of Anatomy, Obstetrics, and Clinics, *ibid.*, 1909-1911; Veterinary Inspector, United States Bureau of Animal Industry, Summer, 1911; Assistant Professor of Veterinary Medicine, Kansas State Agricultural College, 1911-1913; Professor of Surgery, *ibid.*, December 1, 1913—.

Office V 31; Res. 714 Houston St.

## WALTER SCOTT GEARHART, B. S. in C. E.,

*Professor of Highway Engineering<sup>6</sup>; State Highway Engineer, Division of College Extension.*

Student, Bucknell University, 1899-1902; Chainman, United States Coal and Coke Company (West Virginia); Transitman, Pennsylvania Railroad Company (Pennsylvania) and Pere Marquette Railroad Company (Michigan); Assistant Engineer, Chicago and Alton Railroad Company (Missouri); Assistant State Highway Engineer, Illinois State Highway Commission; B. S. in C. E., University of Missouri, 1907; Highway Engineer, Division of College Extension, Kansas State Agricultural College, 1909-1911; State Engineer, *ibid.*, 1911—; Professor of Highway Engineering, *ibid.*, 1914—.

Office A 36; Res. 1010 Vattier St.

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*Professor of Electrical Engineering.*

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*Professor of Heating and Sanitation.*

## ULA MAY DOW, B. S., A. M.,

*Associate Professor in Charge of Domestic Science.*

B. S., Kansas State Agricultural College, 1905; Teacher's Diploma, Massachusetts State Normal School, 1906; Assistant in Domestic Science, Kansas State Agricultural College, 1906; Instructor in Domestic Science, *ibid.*, 1906-1909; Assistant Professor of Domestic Science, *ibid.*, 1909-1913; A. M. in Education, Columbia University, 1913; Associate Professor in Charge of Domestic Science, Kansas State Agricultural College, 1913—.

Office L 30; Res. R. R. No. 1.

## MICHAEL FRANCIS AHEARN, M. S.,

*Associate Professor of Horticulture.*

B. S., Massachusetts Agricultural College, 1904; Assistant in Horticulture, Kansas State Agricultural College, 1904-1909; Head Coach in Athletics, *ibid.*, 1905-1911; Instructor in Horticulture, *ibid.*, 1909-1911; M. S., *ibid.*, 1913; Assistant Professor of Floriculture, *ibid.*, 1911-1913; Associate Professor of Horticulture, *ibid.*, 1913—.

Office H 32; Res. 507 Laramie St.

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6. Effective September 1, 1914.

## HARRY LLEWELLYN KENT, B. S.,

*Principal of School of Agriculture; Associate Professor of Education.*

Graduate, Kansas State Normal School, 1904; Assistant, Science Department, *ibid.*, 1902-1904; Instructor in Science and Geography, Western State Normal School, 1904-1909; Student, University of Chicago, Summer, 1908; Special Student, Kansas State Agricultural College, Summer, 1909; Instructor in Nature Study and Elementary Agriculture, New Hampshire State Normal School, 1909-1911; Student, Cornell University, Summer, 1910; Director of Instruction by Correspondence, Division of College Extension, Kansas State Agricultural College, 1911-1913; A. B., Kansas State Normal School, 1912; B. S., Kansas State Agricultural College, 1913; Principal of School of Agriculture, and Associate Professor of Education, *ibid.*, 1913—.

Office G 29 and 30; Res. 321 Delaware Ave.

## WILLIAM HIDDLESON ANDREWS, A. B.,

*Associate Professor of Mathematics.*

Principal, Beloit High School, 1897-1898; A. B., University of Chicago, 1900; Superintendent, Blue Rapids City Schools, 1901-1905; Instructor in Mathematics, Leavenworth High School, 1905-1906; Assistant in Mathematics, Kansas State Agricultural College, 1906-1907; Graduate Student, University of Chicago, Summer, 1911; Assistant Professor of Mathematics, *ibid.*, 1907-December 1, 1913; Principal of Subfreshman Department, *ibid.*, 1910-1913; Associate Professor of Mathematics, *ibid.*, December 1, 1913—.

Office A 64; Res. 630 Moro St.

## HARRY BRUCE WALKER, B. S. in C. E.,

*Associate Professor of Irrigation and Drainage Engineering<sup>6</sup>; Drainage Engineer, College of Extension.*

Student, Iowa State College, 1906-1910; Topographer, Chicago, Burlington and Quincy Railroad Company, 1906-1907; Student Assistant, Iowa State College, 1909-1910; Draftsman, Great Northern Railway Company, 1910; Drainage Engineer, Humboldt, Iowa, 1909-1910; B. S. in C. E., Iowa State College, 1910; Drainage Engineer, Division of College Extension, Kansas State Agricultural College, 1910—; Associate Professor of Irrigation and Drainage Engineering, *ibid.*, 1914—.

Office A 36; Res. 712 Poyntz Ave.

## WALTER WILLIAM CARLSON, B. S.,

*Associate Professor of Shop Practice<sup>6</sup>; Superintendent of Shops.*

Apprentice in Machine Shops, Kansas State Agricultural College, 1903-1904; B. S., *ibid.*, 1908; Instructor in Mechanical Engineering, Montana State College, 1908-1909; Graduate Student, Armour Institute, Summer, 1909; Assistant Professor of Mechanical Engineering, Montana State College, 1909-1910; Assistant in Machine Tool Work, Kansas State Agricultural College, 1910-1911; Instructor in Machine Tool Work, *ibid.*, 1911-1912; Foreman of Machine Shop, *ibid.*, 1910-1912; Superintendent of Shops, *ibid.*, 1912—; Assistant Professor of Shop Methods and Practice, *ibid.*, 1912-1914; Associate Professor of Shop Practice, *ibid.*, 1914—.

Office S 62; Res. 1130 Bluemont Ave.

## GEORGE KELLER HELDER,

*Superintendent, Fort Hays Branch Agricultural Experiment Station.*

Student, Kansas State Agricultural College, 1888-1890; Clerk, First National Bank, Manhattan, 1891-1901; Cashier, *ibid.*, 1901-1904; Bookkeeper, Fort Hays Branch Experiment Station, 1904-1906; Secretary, *ibid.*, 1907-1908; Assistant Superintendent and Secretary, *ibid.*, 1909-January 1, 1913; Superintendent, *ibid.*, January 1, 1913—.

Office and Res. Hays, Kansas.

## GEORGE SHERWOOD HINE, B. S. A.,

*State Dairy Commissioner.*

B. S. A., University of Wisconsin, 1907; Student Instructor in Farm Engineering, *ibid.*, 1907; Assistant in Feed and Fertilizer Inspection and Dairy Tests, *ibid.*, 1907-1908; Principal, Marinette (Wisconsin) County School of Agriculture and Domestic Economy, 1909; Lecturer on Dairying, Department of College Extension, Kansas State Agricultural College, 1910-1912; State Dairy Commissioner, 1912—.

Office X 26; Res. 501 Laramie St.

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6. Effective September 1, 1914.

## JACOB LUND, M. S.,

*Superintendent of Heat and Power.*

B. S., Kansas State Agricultural College, 1883; Steam Fitter and Instructor in Blacksmithing, *ibid.*, 1883-1886; M. S., *ibid.*, 1886; Machinist, Santa Fe Railroad Shops, Topeka, 1886-1888; with Las Vegas Hot Springs Company, Las Vegas Hot Springs, New Mexico, 1888-1891; General Repairer, Sidney (Washington) Shingle Mill, 1891-1892; Engineer and Fireman, Capital Iron Works, Topeka, 1892-1893; Steam Fitter and Fireman, Kansas State Agricultural College, 1893-1898; Engineer, *ibid.*, 1898-1901; Superintendent, Heat and Power Department, *ibid.*, 1901-1912; Superintendent of Heat, Water, and Gas Distribution, *ibid.*, 1912-1914; Superintendent of Heat and Power, *ibid.*, 1914—  
Office S 34; Res. 1420 Fairchild Ave.

## ROBERT HENRY BROWN, B. M.,

*Assistant Professor of Music.*

B. M., Kansas Conservatory of Music, 1893; B. S., Kansas State Agricultural College, 1893; Special Student, Chicago Musical College, 1893-1900; Instructor in Violin and Band Instruments, Kansas State Agricultural College, 1900-1905; Assistant Professor of Music and Director of Orchestra, *ibid.*, 1905—  
Office M 27; Res. 331 N. Seventeenth St.

## PLEASANT CRABTREE,

*Lecturer on Farm Management, Division of College Extension.*

Student, Fort Scott Normal Institute, 1885; Student, Lamar (Missouri) Normal Institute, 1885-1889; Instructor, Missouri Public Schools, 1886-1889; Student, Denver Business College, 1897; Editor, *Agricultural and Live Stock Herald*, Denver, 1897-1900; Lecturer, Missouri Farmers' Institutes, 1900-1904; Lecturer on Farm Management, Division of College Extension, Kansas State Agricultural College, 1908—  
Office A 36; Res. 931 Moro St.

## HERBERT HIRAM KING, A. M.,

*Assistant Professor of Chemistry; Assistant Chemist in Engineering Experiment Station.*

A. B., Ewing College, 1904; Professor of Chemistry, Manchester College, 1904-1906; A. M., Ewing College, 1906; Assistant in Chemistry, Kansas State Agricultural College, 1906-1908; Instructor in Chemistry, *ibid.*, 1908-1909; Graduate Student in Physical Chemistry, University of Chicago, Summer Session, 1909; Assistant Professor of Chemistry, Kansas State Agricultural College, 1909—; Assistant Chemist, Engineering Experiment Station, *ibid.*, 1910—  
Office C 56; Res. 916 Humboldt St.

## CHARLES OSCAR SWANSON, M. AGR.,

*Assistant Professor of Agricultural Chemistry; Assistant Chemist in Agricultural Experiment Station.*

A. B., Carlton College, 1899; Principal, Jackson (Minnesota) High School, 1899-1900; Instructor, Cannon Falls (Minnesota) High School, 1900-1903; M. Agr., University of Minnesota, 1905; Instructor in Agricultural Chemistry and Assistant Chemist in Experiment Station, Purdue University, 1905-1906; Assistant Chemist in Agricultural Experiment Station, Kansas State Agricultural College, 1906—; Assistant Professor of Agricultural Chemistry, *ibid.*, 1909—  
Office C 6; Res. 931 Bluemont Ave.

## GEORGE EBEN BRAY, M. E.,

*Industrial Engineer, Division of College Extension.*

M. E., University of Minnesota, 1894; Instructor in Manual Training, Logan High School, Minneapolis, Minnesota, 1897-1898; Supervisor of Manual Training, Superior (Wisconsin) Public Schools, 1900-1903; Graduate Student, Columbia University, Summer, 1902; Graduate Student, University of Minnesota, Summer, 1902; Director of Mechanical Drawing and Manual Arts, New Trier Township High School, Kenilworth, Illinois, 1903-1909; Assistant Professor of Mechanical Engineering, Kansas State Agricultural College, 1909-1910; Superintendent of Shops, *ibid.*, 1909—; Assistant Professor of Shop Methods and Practice, *ibid.*, 1910-1912; Industrial Engineer, Division of College Extension, *ibid.*, 1912—  
Office A 34; Res. 817 Osage St.

## WILMER ESLA DAVIS, A. B.,

*Assistant Professor of Botany.*

Graduate, Ohio Normal University, 1894; Public School Work, 1894-1900; A. B., University of Illinois, 1903; Principal, Rossville (Illinois) High School, 1903-1904; Instructor, Great Falls (Montana) High School, 1904-1905; Instructor in Science, Urbana (Illinois) High School, 1905-1908; Graduate Student in Botany, University of Chicago, 1908-1909, and Summers, 1908, 1909, and 1910; Assistant Professor of Botany, Kansas State Agricultural College, 1909—.

Office H 57; Res. 831 Leavenworth St.

## FRANCES LANGDON BROWN, B. S.,

*Lecturer on Domestic Science, Division of College Extension.*

Graduate, Kansas State Normal School, 1898 and 1906; Instructor, Madison (Kansas) City Schools, 1899-1900; Instructor, Shorey Public Schools, 1901-1902; Instructor, Topeka City Schools, 1902-1908; Student, State Manual Training Normal School, 1908; B. S., Kansas State Agricultural College, 1909; A. B., Kansas State Normal School, 1913; Lecturer on Domestic Science, Division of College Extension, Kansas State Agricultural College, 1909—.

Office A 35; Res. 519 Houston St.

## JAMES HENRY BURT, D. V. M.,

*Assistant Professor of Veterinary Medicine.*

V. S., Ontario Veterinary College, 1895; Private Practice, 1895-1903; D. V. M., Ohio State University, 1905; Veterinary Inspector, United States Bureau of Animal Industry, 1905-1909; Assistant in Veterinary Medicine, Kansas State Agricultural College, 1909-1910; Graduate Student, University of Michigan, Summer, 1910; Assistant Professor of Veterinary Medicine, Kansas State Agricultural College, 1910—.

Office V 27; Res. 811 Poyntz Ave.

ARTHUR HENRY LEIDIGH,<sup>1</sup> B. S.,*Assistant Professor of Crops.*

B. S., Kansas State Agricultural College, 1902; Farm Hand, 1902-1903; with Office of Grain Investigations, United States Department of Agriculture, as Superintendent of Experiment Station, Channing, Texas, 1903-1905; Superintendent Experiment Station, Amarillo, Texas, 1905-1908; Farmer, Hutchinson, Kansas, 1908-1911; Collaborator, United States Department of Agriculture, 1908-1911; Assistant Professor of Crops, Kansas State Agricultural College, 1911 - October 1, 1913.

## EVERETT PARKER JOHNSTON, A. B.,

*Assistant Professor in Charge of Public Speaking.*

A. B., Oberlin College, 1897; Graduate, Emerson College of Oratory, 1899; Instructor in Public Speaking, University of North Dakota, 1899-1902; Graduate Student, University of Chicago, Summer, 1901; Reader under Management Chicago Lyceum Bureau, 1907-1909; Assistant in Public Speaking, Kansas State Agricultural College, 1909-1910; Instructor in Public Speaking, *ibid.*, 1910-1911; Assistant Professor in Charge of Public Speaking, 1911—.

Office F 3; Res. 608 Bluemont Ave.

## ALFRED EVERETT WHITE, M. S.,

*Assistant Professor of Mathematics.*

B. S., Purdue University, 1904; Principal, Lapel (Indiana) High School, 1904-1906; Instructor, Shortridge High School, Indianapolis, 1906-1907; Principal, Connorsville (Indiana) High School, 1907-1909; Assistant in Mathematics, Kansas State Agricultural College, 1909-1910; Instructor in Mathematics, *ibid.*, 1910-1912; Assistant Professor of Mathematics, *ibid.*, 1912—.

Office A 72; Res. 712 Poyntz Ave.

## CHARLES WILBUR McCAMPBELL, B. S., D. V. M.,

*Assistant Professor of Animal Husbandry.*

B. S., Kansas State Agricultural College, 1906; Graduate Student, *ibid.*, 1906-1907; D. V. M., *ibid.*, 1910; Assistant in Animal Husbandry, *ibid.*, 1910-1912; Secretary, Kansas State Live Stock Registry Board, 1912—; Assistant Professor of Animal Husbandry, Kansas State Agricultural College, 1912—.

Office Ag 5; Res. 801 Laramie St.

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1. Resigned.

## GEORGE OGDEN GREENE, M. S.,

*Lecturer on Horticulture, Division of College Extension.*

B. S., Kansas State Agricultural College, 1900; Assistant in Horticulture, *ibid.*, 1901-1903; M. S., *ibid.*, 1902; Assistant in Horticulture, Massachusetts Agricultural College, 1903-1905; with Worley and Greene, Merchants, 1905-1910; Lecturer on Horticulture, Division of College Extension, Kansas State Agricultural College, 1912—.

Office A 36; Res. 915 Fremont St.

## EDWARD CARL JOHNSON, A. M.,

*Superintendent of Farmers' Institutes and Demonstrations, Division of College Extension.*

Student Assistant in Botany, University of Minnesota, 1905-1906; A. B., *ibid.*, 1906; Instructor in Botany, *ibid.*, 1906-1907; A. M., *ibid.*, 1907; Assistant Plant Pathologist, United States Department of Agriculture, 1907; Plant Pathologist, in Charge of Cereal Disease Work, *ibid.*, 1898-1912; Graduate Student, George Washington University, 1910-1911; Superintendent of Farmers' Institutes and Demonstrations, Division of College Extension, Kansas State Agricultural College, 1912—.

Office A 37; Res. 1130 Houston St.

## CARL OSTRUM, A. M.,

*Assistant Professor of the English Language.*

A. B., Bethany College, 1904; A. B., Yale University, 1905; Graduate Student, *ibid.*, 1905-1907; A. M., *ibid.*, 1906; Instructor in English, Gustavus Adolphus College, 1907-1908; Principal, Bunkerhill (Kansas) High School, 1908-1910; Acting Professor of English, Tabor College, 1910-1911; Instructor in English, Oklahoma College of Agriculture and Mechanic Arts, 1911-1912; Assistant Professor of the English Language, Kansas State Agricultural College, 1912—.

Office A 69; Res. 815 Poyntz Ave.

## ALVIN SCOTT NEALE, B. S. A.,

*Assistant Superintendent of Farmers' Institutes and Lecturer on Dairy Husbandry, Division of College Extension.*

Superintendent of Farm, Ohio State University, 1903-1904; B. S. A., *ibid.*, 1904; Agricultural Correspondent, Scripps-McRea League of Newspapers, 1904-1907; Dairy Lecturer, Agricultural Extension Department, Ohio State University, 1908-1913; Lecturer on Dairy Husbandry, Division of College Extension, Kansas State Agricultural College, January 1, 1913—; Assistant Superintendent of Farmers' Institutes, Division of College Extension, *ibid.*, 1913—.

Office A 36; Res. 1 Park Road.

## PORTER JOSEPH NEWMAN, M. S.,

*Assistant Professor of Chemistry.*

B. S., Franklin College, 1908; Assistant in Chemistry, *ibid.*, 1907-1908; Assistant Chemist, Indianapolis Board of Health, 1907-1908; Graduate Student, University of Chicago, Summer, 1909; Assistant in Chemistry, Kansas State Agricultural College, 1909-1910; M. S., Franklin College, 1910; Instructor in Chemistry, *ibid.*, 1910-1913; Assistant Professor of Chemistry, Kansas State Agricultural College, 1913—.

Office C 64; Res. 914 Leavenworth St.

## WILLIAM CARL LANE, B. S.,

*Assistant Professor of Electrical Engineering.*

B. S., Kansas State Agricultural College, 1905; Student Apprentice with Allis-Chalmers Company, 1905-1906; Electrical Tester with Allis-Chalmers Company, 1906-1907; Assistant in Physics, Kansas State Agricultural College, 1907-1908; Assistant in Electrical Engineering, *ibid.*, 1908-1913; Assistant Professor of Electrical Engineering, *ibid.*, 1913—.

Office C 33; Res. 1031 Humboldt St.

## NELSON ANTRIM CRAWFORD, JR., A. M.,

*Assistant Professor of the English Language.*

Newspaper Writer, Iowa City and Council Bluffs (Iowa), 1906-1909; Undergraduate Assistant in English, State University of Iowa, 1909-1910; A. B., *ibid.*, 1910; Instructor, Kansas Teachers' Institutes, 1912—; Graduate Student, University of Kansas, 1913-1914; A. M., *ibid.*, 1914; Assistant in English, Kansas State Agricultural College, 1910-1911; Assistant in the English Language, *ibid.*, 1911-1912; Instructor in the English Language, *ibid.*, 1912-1913; President, Kansas Association of Teachers of English, 1913—; Assistant Professor of the English Language, Kansas State Agricultural College, 1913—.

Office A 53; Res. 221 N. Juliette Ave.

## JOSIAH SIMSON HUGHES, M. S.,

*Assistant Professor of Chemistry.*

B. S., Ohio Wesleyan University, 1908; Instructor, *ibid.*, 1908-1909; M. S., *ibid.*, 1909; Fellow, Ohio State University, 1909-1910; A. M., *ibid.*, 1910; Assistant in Chemistry, Kansas State Agricultural College, 1910-1912; Instructor in Chemistry, *ibid.*, 1912-1913; Assistant Professor of Chemistry, *ibid.*, 1913—  
Office C 41; Res. 607 Vattier St.

## GRACE EMILY DERBY, A. B.,

*Assistant Librarian.*

A. B., Western College for Women, Oxford, Ohio, 1905; Graduate Student, Illinois State Library School, 1905-1906; Reference Assistant in Library, University of Illinois, 1906-1907; Librarian, Western College for Women, 1907-1911; Reference Librarian, Kansas State Agricultural College, 1911-1913; Assistant Librarian, *ibid.*, 1913—  
Office F 32; Res. 1633 Fairchild Ave.

## RAY IAMS THROCKMORTON, B. S.,

*Assistant Professor of Soils.*

B. S., Pennsylvania State College, 1911; Assistant in Soils, Kansas State Agricultural College, February, 1912-1913; Assistant Professor of Soils, 1913—  
Office Ag 60; Res. 815 Poyntz Ave.

## JAMES EDWARD ACKERT, PH. D.,

*Assistant Professor of Zoölogy; Parasitologist in Agricultural Experiment Station.*

Graduate, Northern Illinois State Normal School, 1903; Principal, Algonquin (Illinois) High School, 1903-1907; A. B., University of Illinois, 1909; Graduate Assistant in Zoölogy, *ibid.*, 1909-1911; A. M., *ibid.*, 1911; Fellow in Zoölogy, *ibid.*, 1911-1913; Graduate Student, University of Illinois, Summer, 1910; Graduate Student, Biological Station of University of Colorado, Tolland, Colorado, Summer, 1910; Graduate Student (Collector), Marine Biological Station, San Diego, California, Summer, 1911; Ph. D., University of Illinois, 1913; Professor of Vertebrate Zoölogy and Physiology, Illinois State Normal University, Summer, 1913; Instructor in Zoölogy, University of Washington (one month), 1913; Assistant Professor of Zoölogy and Parasitologist in Agricultural Experiment Station, Kansas State Agricultural College, 1913—  
Office F 62; Res. 901 Laramie St.

## HOWARD W BRUBAKER, PH. D.,

*Assistant Professor of Chemistry.*

B. S., Carleton College, 1899; Ph. D., University of Pennsylvania, 1904; Professor of Chemistry, Whitman College, 1904-1911; Honorary Fellow, Cornell University, 1911-1912; Instructor in Physical Chemistry and Electrochemistry, Carnegie Institute of Technology, 1912-1913; Assistant Professor of Chemistry, Kansas State Agricultural College, 1913—  
Office W 27; Res. 1116 Fremont St.

## JOHN WALTER GOOD, PH. D.,

*Assistant Professor of English Literature.*

A. B., Erskine College, Duewest, South Carolina, 1902; A. M., *ibid.*, 1904; Graduate, Erskine Theological Seminary, 1904; Graduate, Pittsburg (Pennsylvania) Theological Seminary, 1905; Pastor, First United Presbyterian Church, Corsicana, Texas, 1905-1906; Pastor, United Presbyterian Church, Birmingham, Michigan, 1906-1908; Superintendent of Public Schools, Albion, Illinois, 1908-1910; Scholar and Fellow in Graduate School, University of Illinois, 1910-1913; Ph. D., *ibid.*, 1913; Assistant Professor of English Literature, Kansas State Agricultural College, 1913—  
Office A 58; Res. 807 Osage St.

## JOHN C WERNER, A. M.,

*Director of Instruction by Correspondence, Division of College Extension.*

Graduate, Tri-State Normal School, Angola, Indiana, 1899; Principal, Perry Township Consolidated Schools, Miami County, Indiana, 1899-1904; A. B., University of Indiana, 1905; Instructor in Mathematics, West Side High School, Lafayette, Indiana, 1905-1906; County Superintendent of Schools, Fulton County, Indiana, 1906-1911; President, Rochester (Indiana) Normal University, 1911-1912; Graduate Student, University of Chicago, 1912-1913; A. M., *ibid.*, 1913; Director of Instruction by Correspondence, Kansas State Agricultural College, September 25, 1913—  
Office A 34; Res. 1000 Kearney St.



## SAMUEL CECIL SALMON, B. S.,

*Assistant Professor of Farm Crops.*

B. S., South Dakota Agricultural and Mechanical College, 1907; Special Agent, United States Department of Agriculture, 1908-1910; Plant Physiologist, *ibid.*, 1911-1913; Assistant Professor of Farm Crops, Kansas State Agricultural College, October 1, 1913—.  
Office Ag 82; Res. 1638 Leavenworth St.

## EDWARD HARTMAN REISNER, PH. D.,

*Assistant Professor of Education.*

B. E., Cumberland Valley State Normal School, Shippensburg, Pennsylvania, 1901; A. B., Yale University, 1908; Larned Fellow, *ibid.*, 1908-1909; A. M., *ibid.*, 1909; Graduate Student, Columbia University, 1909-1911; Ph. D., *ibid.*, 1914; Secretary, National Society for the Promotion of Industrial Education, 1910-1911; Professor of Philosophy and Education, Washburn College, 1911-November 1, 1913; Assistant Professor of Education, Kansas State Agricultural College, November 1, 1913—.  
Office A 66; Res. 1636 Osage St.

## EDWARD DONALD BAKER, A. M.,

*Assistant Professor of Rural Economics.*

A. B., University of Chicago, 1903; Graduate Student in Economics, *ibid.*, 1903-1904; Principal, Accomac (Virginia) High School, 1904-1905; Instructor in Economics and Civics, Superior (Wisconsin) High School, 1905-1908; Instructor in Economics and Civics, West High School, Minneapolis, Minnesota, 1908-1911; A. M., Columbia University, 1912; Graduate Student in Economics and Political Science, University of Chicago, 1912-1913; Lecturer on Economics, Walton School of Accountancy, and Chicago School of Civics and Philanthropy, Chicago, 1913; Assistant Professor of Rural Economics, Kansas State Agricultural College, January 1, 1914—.  
Office A 54; Res. 412 Poyntz Ave.

## CHARLES HENRY TAYLOR, B. S. A.,

*Lecturer on Animal Husbandry, Division of College Extension.*

B. S. A., University of Missouri, 1908; Stock and Fruit Farmer, Shubert, Nebraska, March, 1909-December, 1913; Lecturer on Animal Husbandry, Division of College Extension, Kansas State Agricultural College, January 1, 1914—.  
Office A 36; Res. 1021 Osage St.

## HARRISON ELEAZER PORTER, B. S.,

*Assistant Professor of Mathematics.<sup>6</sup>*

B. S., Kansas State Agricultural College, 1907; with Engineering Department, Santa Fe Railway, Summer, 1907; Graduate Student, Harvard University, Summer, 1910; Graduate Student, Columbia University, Summer, 1911; Assistant in Mathematics, Kansas State Agricultural College, 1908-1912; Instructor in Mathematics, *ibid.*, 1912-1914; Assistant Professor of Mathematics, *ibid.*, 1914—.  
Office A 70; Res. 1024 Houston St.

## WILLIAM TIMOTHY STRATTON, A. M.,

*Assistant Professor of Mathematics.<sup>6</sup>*

A. B., University of Indiana, 1906; Superintendent, Oneida (Illinois) Public Schools, 1906-1907; Principal, McCray-Dewey Academy, Troy, Illinois, 1907-1910; Graduate Student, University of Indiana, Summers, 1910 and 1911; Instructor, Kansas Teachers' Institutes, 1911-1913; Assistant in Mathematics, Kansas State Agricultural College, 1910-1912; A. M., University of Indiana, 1913; Instructor in Mathematics, Kansas State Agricultural College, 1912-1914; Assistant Professor of Mathematics, *ibid.*, 1914—.  
Office A 54; Res. 1020 Vattier St.

## ADA RICE, M. S.,

*Assistant Principal of School of Agriculture; Instructor in the English Language.*

B. S., Kansas State Agricultural College, 1895; Assistant in English, *ibid.*, 1889-1905; Life Teacher's Certificate for Kansas, 1900; Graduate Student, University of Chicago, 1902; Graduate Student, Harvard University Summer School, 1905; Instructor in English, Kansas State Agricultural College, 1905-1911; M. S., *ibid.*, 1912; Instructor in the English Language, *ibid.*, 1911—; Assistant Principal of the School of Agriculture, *ibid.*, 1913—.  
Office G 28; Res. 917 Osage St.

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6. Effective September 1, 1914.

## DAISY DOROTHY ZEININGER, A. B.,

*Instructor in Mathematics.*

A. B., Fairmount College, 1900; Instructor, Ellsworth High School, 1900-1904; Graduate Student, University of Chicago, Summer, 1909; Assistant in Mathematics, Kansas State Agricultural College, 1904-1907; Instructor in Mathematics, *ibid.*, 1907—.  
Office G 28; Res. 601 Humboldt St.

BURTON RAY ROGERS,<sup>1</sup> D. V. M.,*Instructor in Veterinary Medicine.*

D. V. M., Iowa State College, 1899; Graduate Student, McKillip Veterinary College, Chicago, 1899-1900; House Physician and Demonstrator of Anatomy in Veterinary Department, Iowa State College, 1900; Inspector in Bureau of Animal Industry, United States Department of Agriculture, 1900-1905; Student, Dearborn Night Medical College, Chicago, 1905-1906; Assistant in Veterinary Medicine, Kansas State Agricultural College, 1906-1908; Instructor in Veterinary Medicine, *ibid.*, 1908-March 1, 1914.  
Office V 32; Res. 1111 Houston St.

## INA FOOTE COWLES, B. S.,

*Instructor in Domestic Art.*

B. S., Kansas State Agricultural College, 1901; Graduate Student, Teachers' College, Columbia University, 1905-1906; Assistant in Domestic Art, Kansas State Agricultural College, 1902-1905 and 1906-1909; Graduate Student, Stout Institute, Menomonie, Wisconsin, Summer, 1913; Instructor in Domestic Art, Kansas State Agricultural College, 1909—.  
Office L 56; Res. 1026 Houston St.

## ANNETTE LEONARD, A. B.,

*Instructor in the English Language.*

Student, Wellesley College, 1897-1900; Instructor, Topeka City Schools, 1903-1904; Reference Library Assistant, University of Kansas, 1904-1905; A. B., *ibid.*, 1906; Graduate Student, *ibid.*, 1906; Assistant in English, Kansas State Agricultural College, 1907-1909; Graduate Student, University of Chicago, Summer, 1910; Instructor in English, Kansas State Agricultural College, 1909-1911; Instructor in the English Language, *ibid.*, 1911—.  
Office G 28; Res. 910 Fremont St.

## WILLIAM LEONARD HOUSE,

*Instructor in Woodwork; Foreman of Carpenter Shop.*

Apprentice with J. Adams and Sons Company, Amherst, Massachusetts, 1868-1868; with the Newton Wagon Works, Batavia, Illinois; Foreman, Carpenter Shop, Atchison, Topeka and Santa Fe Railroad Company, Las Vegas, New Mexico, 1880-1883; Cabinet-maker, with The Howell Company, Sioux City, Iowa, 1883-1888; Foreman of Carpenter Shop, Kansas State Agricultural College, 1888—; Instructor in Woodwork, *ibid.*, 1909—.  
Office S 28; Res. 608 Moro St.

JEREMIAH HAFFER HOLLAR,<sup>2</sup>*Instructor in Forging; Foreman of Blacksmith Shop.*

Apprentice in Blacksmithing, Greenspring, Pennsylvania; Foreman, Lake Shore and Michigan Southern Railway Shops, White Pigeon, Michigan; with Miller Machine and Iron Company, Muskegon, Michigan, 1880-1882; with Novelty Iron Works, *ibid.*, 1882-1885; with Rogers Iron Works, *ibid.*, 1885-1887; in General Blacksmithing, 1887-1903; Instructor, Illinois Manual Training School, Glenwood, Illinois, 1903-1908; with Ornamental Iron Works, Chicago, 1908-1909; Instructor in Forging, Foreman of Blacksmith Shop, Kansas State Agricultural College, 1909—.  
Office S 38; Res. 519 N. Juliette Ave.

## RAYMOND GARFIELD TAYLOR, A. B.,

*Instructor in History and Civics.*

A. B., University of Kansas, 1907; Principal and Instructor in History, Hiawatha High School, 1907-1910; Graduate Student, University of Kansas, Summer, 1909; Graduate Student, University of Chicago, Summer, 1911; Instructor in History and Civics, Kansas State Agricultural College, 1910—.  
Office F 58; Res. 1819 Humboldt St.

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1. Resigned.

2. Absent on leave after October 1, 1913.

ESTELLA MAY BOOT, A. M.,

*Instructor in the English Language.*

Teacher in Public Schools, Hartley, Iowa, 1897-1898; A. B., University of South Dakota, 1901; Assistant in English and Latin, Cherokee (Iowa) High School, 1901-1906; Principal, *ibid.*, 1906-1908; Graduate Student, State University of Iowa, Summer, 1905; Instructor in Summer School and Institute, Cherokee County, Iowa, 1907-1908; A. M., Northwestern University, 1909; Assistant in English, Kansas State Agricultural College, 1909-1911; Graduate Student, Columbia University, Summers, 1912 and 1913; Instructor in the English Language, Kansas State Agricultural College, 1911—.

Office K 58; Res. Park Place.

JAMES RUSSELL JENNESS, B. S.,

*Instructor in Physics.*

B. S., Denison University, 1906; Professor of Natural Science, Lenox College, 1906-1908; Assistant in Physics, University of Kentucky, 1908-1909; Assistant in Physics, Kansas State Agricultural College, 1909-1911; Graduate Student, University of Chicago, Summers, 1911 and 1912; Instructor in Physics, Kansas State Agricultural College, 1911—.

Office C 61; Res. 1405 Anderson Ave.

FRANK CLYDE HARRIS,<sup>2</sup> B. S.,

*Instructor in Architecture and Drawing.*

B. S., Kansas State Agricultural College, 1908; City Engineer, Manhattan, Kansas, 1907-1909; Supervising Engineer, W. K. Palmer Company, 1909; Assistant in Architecture and Drawing, Kansas State Agricultural College, 1909-1911; Graduate Student, Chicago Art Institute, Summer, 1910; Student, Italy, Germany, and France, Summer, 1911; Instructor in Architecture and Drawing, Kansas State Agricultural College, 1911—.

Office A 66; Res. 630 Bluemont Ave.

EDWIN CYRUS MILLER, PH. D.,

*Instructor in Botany.*

A. B., Lebanon College, 1906; A. B., Yale University, 1907; Graduate Student, *ibid.*, 1907-1910; Ph. D., *ibid.*, 1910; Assistant in Botany, Kansas State Agricultural College, 1910-1911; Instructor in Botany, *ibid.*, 1911—.

Office H 56; Res. 514 N. Juliette Ave.

CHARLES HENRY CLEVINGER, M. S.,

*Instructor in Mathematics.*

B. S., Ohio State University, 1902; Acting Professor of Mathematics and Physics, Drury College, 1903-1904; Instructor in Mathematics, Sheboygan (Wisconsin) High School, 1906-1908; Professor *pro tem.* of Pure and Applied Mathematics, Tarkio College, Spring Term, 1909; M. S., University of Chicago, 1910; Assistant in Mathematics, Kansas State Agricultural College, 1910-1911; Instructor in Mathematics, *ibid.*, 1911—.

Office A 71; Res. 831 Laramie St.

EUSTACE VIVIAN FLOYD, B. S.,

*Instructor in Physics.*

B. S., Earlham College, 1903; Instructor in Chemistry, Westtown School, Philadelphia, Pennsylvania, 1903-1905; Professor of Physics, Guilford College, 1905-1909; Graduate Student and Assistant in Physics, University of Chicago, 1909-1911; Instructor in Physics, Kansas State Agricultural College, 1911—.

Office C 57; Res. 8 Park Road.

IVOR VICTOR ILES, A. M.,

*Instructor in History and Civics.*

Graduate, Eastern Illinois State Normal School, 1901; A. B., University of Kansas, 1905; Fellow in European History, *ibid.*, 1904-1905; A. M., *ibid.*, 1905; Graduate Student and Assistant in History, University of Colorado, 1905-1906; Graduate Student and Assistant in European History, University of Wisconsin, 1906-1907; Instructor in History, Politics, and Economics, Princeton University, 1907-1908; Harrison Fellow in American History, University of Pennsylvania, 1908-1909; Instructor in History, Anaconda (Montana) High School, 1909-1910; Instructor in History, Yale University, 1910-1911; Instructor in History and Civics, Kansas State Agricultural College, 1911—.

Office F 58; Res. 712 Poyntz Ave.

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2. Absent on leave after October 1, 1913.

ERNEST ALEXANDER HEILMAN,<sup>1</sup> A. M.,*Instructor in German.*

A. B., Northwestern College, 1905; A. B., University of Minnesota, 1906; Instructor, Antigo (Wisconsin) High School, 1906-1907; Graduate Student, University of Wisconsin, 1907-1911; A. M., *ibid.*, 1908; Assistant in German, *ibid.*, 1908-1911; Graduate Student, Universities of Berlin and Munich, 1911-1912; Instructor in German, Kansas State Agricultural College, 1911-February 1, 1914.

## JAMES BURGESS FITCH, B. S.,

*Instructor in Dairy Husbandry.*

B. S., Purdue University School of Agriculture, 1910; in Charge of Milk Supply, Children's Aid Association, Indianapolis, Indiana, Summer, 1910; Assistant in Dairy Husbandry, Kansas State Agricultural College, 1910-1912; Instructor in Dairy Husbandry, *ibid.*, 1912—.

Office D 30; Res. 1605 Humboldt St.

## THORNTON HAYES,

*Instructor in Machine Tool Work; Foreman of Machine Shop.*

Apprentice, Atchison, Topeka and Santa Fe Railway Company, 1904-1908; Machinist, Kansas Natural Gas Company, Scipio and Independence, 1908-1909; Foreman of Machine Shop, *ibid.*, 1909-1910; Assistant in Machine Shop, Kansas State Agricultural College, 1910-1912; Instructor in Machine Tool Work, Foreman of Machine Shop, *ibid.*, 1912—.

Office S 81; Res. 1118 Houston St.

EDWIN GEORGE SCHAFER,<sup>1</sup> M. S.,*Instructor in Farm Crops.*

B. S., Kansas State Agricultural College, 1907; Assistant in Agronomy, *ibid.*, 1907-1909; Graduate Student, University of Illinois, 1909-1910; M. S., *ibid.*, 1910; Assistant in Farm Crops, Kansas State Agricultural College, 1910-1912; Instructor in Farm Crops, *ibid.*, 1912-September 15, 1913.

## OLIVER WILLIAM HUNTER, M. S.,

*Instructor in Bacteriology.*

B. S., Kansas State Agricultural College, 1909; Student Assistant and Graduate Student in Bacteriology, *ibid.*, 1909-1910; M. S., University of Wisconsin, 1911; Assistant in Bacteriology, Kansas State Agricultural College, 1911-1912; Instructor in Bacteriology, *ibid.*, 1912—.

Office V 52; Res. 1100 Bluemont Ave.

## EDWARD GRANT,

*Instructor in Molding; Foreman of Foundry.*

Apprentice, with More and Dargie, Engineers, Millwrights, Iron and Brass Founders, Brechin, Forfarshire, Scotland, 1880-1886; with the Chicago Tire and Spring Company, Melrose Park, Illinois, 1887-1890; Foreman of Foundry, R. Beaumont and Son, Kankakee, Illinois, 1890-1897; with the David Bradley Manufacturing Company, Bradley, Illinois, 1897-1900; Foreman of Foundry, Burrell Manufacturing Company, *ibid.*, 1900-1905; Foreman, North Star Iron Works, Hammond, Indiana, 1905-1908; Foreman, Burrell Manufacturing Company, Bradley, Illinois, 1908-1913; Instructor in Molding, Foreman of Foundry, Kansas State Agricultural College, January 7, 1913—.

Office S 42; Res. 1217 Kearney St.

## MARY THERESA HARMAN, PH. D.,

*Instructor in Zoölogy.*

Student Assistant in Botany and Zoölogy, Indiana State Normal School, 1903-1904; Graduate, *ibid.*, 1904; Teaching Fellow, Biological Station, University of Indiana, Summer, 1905; Instructor in Embryology and Histology, *ibid.*, Summers, 1906-1909, 1911, 1912; A. B., *ibid.*, 1907; Instructor in Zoölogy, Pennsylvania State College, 1907-1910; A. M., University of Indiana, 1909; Teaching Fellow in Zoölogy, *ibid.*, 1910-1912; Ph. D., *ibid.*, 1912; Instructor in Zoölogy, Kansas State Agricultural College, 1912—.

Office F 54; Res. 1415 Fairchild Ave.

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1. Resigned.

## ELDEN VALORIUS JAMES, A. M.,

*Instructor in History and Civics.*

Principal, Caywood (Ohio) Public Schools, 1895-1897 and 1901-1902; A. B., Marietta College, 1901; Assistant Principal, Williamstown (West Virginia) High School, 1902-1904; A. B., University of Michigan, 1905; Head of Department of History, Monmouth (Illinois) High School, 1905-1906; Principal, West Palm Beach (Florida) High School, 1906-1908; A. M., Marietta College, 1908; Instructor in History, *ibid.*, Summers, 1902, 1908, 1908, 1910; Professor of History and Economics, West Virginia Wesleyan College, 1908-1909; Head of Department of History, Wichita High School, 1909-1911; Vice Principal, *ibid.*, 1911-1912; Instructor, Barber County Normal Institute, 1912; Instructor in History and Civics, Kansas State Agricultural College, 1912—.

Office F 1; Res. 621 Humboldt St.

## JOSEPH HENRY MERRILL, B. S.,

*Instructor in Entomology; Assistant Entomologist.*

B. S., Dartmouth College, 1905; on Insect Pest Suppression Work, Massachusetts, 1905-1908; Graduate Student in Entomology, Massachusetts Agricultural College, 1909-1911; Deputy State Nursery Inspector, Massachusetts, 1910-1911; Instructor in Entomology, Assistant Entomologist, Kansas State Agricultural College, 1912—.

Office F 55.

MAURICE COLE TANQUARY,<sup>3</sup> PH. D.,*Instructor in Entomology; Assistant Entomologist.*

A. B., University of Illinois, 1907; Assistant to Illinois State Entomologist, 1907-1909; Assistant in Entomology and Zoölogy, University of Illinois, 1907-1909; A. M., *ibid.*, 1908; Assistant in Entomology, *ibid.*, 1909-1912; Graduate Student, Bussey Institution, Harvard University, Summer, 1910; Assistant to Minnesota State Entomologist, Summer, 1911; Ph. D., University of Illinois, 1912; Instructor in Entomology and Assistant Entomologist, Kansas State Agricultural College, 1912—.

## CLAUDE M VESTAL, B. S. A.,

*Instructor in Animal Husbandry.*

B. S. A., Purdue University, 1911; Assistant in Agricultural Extension, *ibid.*, 1911-1912; Instructor in Animal Husbandry, Kansas State Agricultural College, 1912—.

Office Ag 13; Res. 815 Poyntz Ave.

## ADALINE MAITLAND BAKER, B. L. S.,

*Head Cataloguer in Library.*

B. L. S., University of Illinois, 1902; Head Cataloguer in Library, Northwestern University, 1902 - May 1, 1913; Head Cataloguer in Library, Kansas State Agricultural College, May 1, 1913—.

Office F 27; Res. 909 Fremont St.

## HARLAN DAVID SMITH, B. S.,

*Instructor in Charge of Industrial Journalism.*

B. S., Kansas State Agricultural College, 1911; Assistant in Industrial Journalism, *ibid.*, 1911-1913; Instructor in Charge of Industrial Journalism, *ibid.*, 1913—.

Office K 52; Res. 626 Moro St.

## JENNIE ELIZABETH CATON, B. S.,

*Instructor in Domestic Science.*

Student, School of Science, Simmons College, 1904-1908; Student, School of Household Economics, *ibid.*, 1910-1911; B. S., *ibid.*, 1911; Assistant in Domestic Science, Kansas State Agricultural College, 1911-1913; Instructor in Domestic Science, *ibid.*, 1913—.

Office L 35; Res. 609 N. Ninth St.

## CARLOTTA MARKS FORD, A. B.,

*Instructor in Domestic Science.*

Instructor, Geneva (Illinois) Schools, 1903-1904; Student, Northern Illinois State Normal School, Summer, 1904; Instructor, North Aurora (Illinois) School, 1906-1907; A. B., University of Illinois, 1911; Assistant in Domestic Science, Kansas State Agricultural College, 1911-1913; Instructor in Domestic Science, *ibid.*, 1913—.

Office L 34; Res. 909 Fremont St.

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3. Absent on leave.

CLARA LOUISE COITH NELSON, B. P.,

*Instructor in Drawing.*

B. P., Illinois State Normal University, 1906; Supervisor of Drawing, Riverside (Illinois) Public Schools, 1906-1908; Graduate Student, Pratt Institute, Brooklyn, New York, 1909-1910; Principal, Greenleaf (Kansas) High School, 1911-1912; Assistant in Drawing, Kansas State Agricultural College, 1912-1913; Instructor in Drawing, *ibid.*, 1913—.  
Office A 68; Res. 815 Fremont St.

VIRGINIA LEE MEADE, B. S.,

*Instructor in Domestic Science.*

B. S., Kansas State Agricultural College, 1909; Lecturer and Demonstrator in Domestic Science, Chautauqua Assemblies, Summer, 1909; Substitute Assistant in Domestic Science, Kansas State Agricultural College, Fall Term, 1909; Instructor in Manual Training, Topeka Public Schools, 1910; Graduate Student, Teachers' College, Columbia University, Summer, 1910; Instructor in Domestic Science, Topeka High School, 1910-1912; Assistant in Domestic Science, Kansas State Agricultural College, 1912-1913; Instructor in Domestic Science, *ibid.*, 1913—.  
Office L 85; Res. 810 Pierre St.

IDA ETHEL RIGNEY, B. S.,

*Instructor in Domestic Science.*

B. S., Kansas State Agricultural College, 1909; Dietitian, Ensworth Hospital, St. Joseph, Missouri, 1909-1910; Instructor, Wichita (Kansas) High School, 1910-1912; Assistant in Domestic Science, Kansas State Agricultural College, 1912-1913; Instructor in Domestic Science, *ibid.*, 1913—.  
Office L 85; Res. 1207 Poyntz Ave.

HALLAM WALKER DAVIS, A. M.,

*Instructor in the English Language.*

A. B., University of Indiana, 1909; Principal, Poseyville (Indiana) High School, 1905-1907; Superintendent, Fort Branch (Indiana) Public Schools, 1909-1913; Graduate Student, Columbia University, Summers, 1910-1913; A. M., *ibid.*, 1913; Instructor in the English Language, Kansas State Agricultural College, 1913—.  
Office A 53; Res. 1221 Laramie St.

BERTHA GERICKE,

*Research Assistant in Library.*

Graduate, Hoehere Toechterschule, Berlin, Germany, 1894; Private Pupil in Vocal Music, with Frau Dr. Levysohn, Berlin, 1894-1898; Instructor in German, Private Schools, Washington, D. C., 1907-1912; Private Pupil in Library Science, *ibid.*, 1911-1912; Assistant in Library, Bureau of Plant Industry, United States Department of Agriculture, May, 1912-February, 1913; Special Work in Library, *ibid.*, August, 1913; Research Assistant in Library, Kansas State Agricultural College, 1913—.  
Office F 27; Res. 1415 Fairchild Ave.

CHARLES WESLEY HOBBS, D. V. S.,

*Instructor in Veterinary Medicine.*

D. V. S., Western Veterinary College, Kansas City, Missouri, 1901; Private Practice, Kensington, 1901-1904; Private Practice, Smith Center, 1904-1913; Instructor in Veterinary Medicine, Kansas State Agricultural College, 1913—.  
Office V 27; Res. 512 Houston St.

CARL JOHN MERNER, B. P. E.,

*Instructor in Physical Education.*

B. P. E., International Young Men's Christian Association College, Springfield, Massachusetts, 1912; Student, Iowa State Teachers' College, 1904-1906, 1907-January 1, 1908, 1909-1910; Director of Physical Education, Gary (Indiana) Public Schools, 1912-1913; Instructor in Physical Education, Kansas State Agricultural College, 1913—.  
Office N 37; Res. 907 Osage St.

ELTA VIRGINIA SAVAGE, A. B.,

*Assistant Reference Librarian.*

A. B., University of Missouri, 1911; Assistant Cataloguer and in Charge of Order Section, University of Missouri Library, 1911-1912; Certificate, New York State Library School, 1913; Assistant Reference Librarian, Kansas State Agricultural College, 1913—.  
Office F 30; Res. 208 N. Fourteenth St.

EUNICE GEORGANNE SELLNER,<sup>1</sup>*Instructor in Physical Training for Women.*

Graduate, Sargent's Normal School for Physical Training, 1912; Student, Harvard Summer School of Physical Education, Summers, 1910 and 1911; Student in Folk and Character Dances, Munich, Germany, Summer, 1912; Instructor in Physical Education and Athletics for Women, Washburn College, 1912-1913; Instructor in Physical Education for Women, Kansas State Agricultural College, 1913-February 7, 1914.  
Office N 3; Res. 923 Vattier St.

## CONSTANCE MIRIAM SYFORD, A. M.,

*Instructor in the English Language.*

A. B., University of Nebraska, 1909; Reader and Assistant in English Language and Literature, *ibid.*, 1908-1910; Scholar in English Language and Literature, *ibid.*, 1909-1910; Fellow in English Language and Literature, *ibid.*, 1910-1911; A. M., *ibid.*, 1911; Graduate Student and Scholar in English, Bryn Mawr College, 1911-1913; Instructor in the English Language, Kansas State Agricultural College, 1913—.  
Office G 32; Res. 721 Poyntz Ave.

## PAUL SMITH WELCH, Ph. D.,

*Instructor in Entomology; Assistant Entomologist, Agricultural Experiment Station.*

A. B., James Millikin University, 1910; Assistant in Biology, *ibid.*, 1909-1910; Assistant Curator, William Barnes Lepidoptera Collection, 1906-1910; A. M., University of Illinois, 1911; Fellow in Zoology, *ibid.*, 1911-1913; Instructor in Entomology, University of Michigan Biological Station, Summers, 1911, 1912, and 1913; Ph. D., University of Illinois, 1913; Instructor in Entomology, and Assistant Entomologist in Agricultural Experiment Station, Kansas State Agricultural College, 1913—.  
Office F 64; Res. 901 Laramie St.

## BERTRAM WHITTIER WELLS, A. B.,

*Instructor in Botany.*

A. B., Ohio State University, 1911; Instructor in Biology, Knox College, 1911-1912; Graduate Student, University of Chicago, Summer, 1912; Substitute in Charge of Department of Botany, Connecticut Agricultural College, 1912-1913; Instructor in Botany, Kansas State Agricultural College, 1913—.  
Office H 56; Res. 426 Leavenworth St.

## FRED CHARLES WINSHIP, A. M.,

*Instructor in the English Language.*

Student, University of Denver, 1898-1902; B. L., Nebraska Wesleyan University, 1904; B. O., Ott School of Expression, Chicago, Illinois, 1905; Private Instructor in Elocution, Nebraska and Colorado, 1908-1910; A. M., University of Denver, 1910; Instructor in the English Language, Kansas State Agricultural College, 1913—.  
Office A 53; Res. 929 Colorado St.

## PAGE BLEDSOE, M. S.,

*Instructor in Farm Crops.*

A. B., Washington and Lee University, 1908; M. S., University of Wisconsin, 1913; Instructor in Farm Crops, Kansas State Agricultural College, September 6, 1913—.  
Office Ag 79; Res. 714 Poyntz Ave.

## GLENN ARTHUR GILBERT, B. S.,

*Instructor in Dairy Husbandry.*

B. S., Michigan Agricultural College, 1909; Instructor in Dairying, Dunn County (Wisconsin) School of Agriculture, 1909-1911; Instructor in Dairying, Colorado Agricultural College, 1911-1913; Student, Graduate School of Agriculture, Iowa State College, Summer, 1910, and Michigan Agricultural College, Summer, 1912; Instructor in Dairy Husbandry, Kansas State Agricultural College, September 20, 1913—.  
Office D 30; Res. 915 Bluemont Ave.

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1. Resigned.

## GEORGE ELDON THOMPSON, B. S.,

*Field Superintendent of Substations.*

B. S., Kansas State Agricultural College, 1910; Scientific Assistant, Division of Forage Crop Investigations, United States Department of Agriculture, 1910-1911; Superintendent of United States Experiment Station, Chillicothe, Texas, 1912; District Demonstration Agent for Southwest Kansas, 1913; Field Superintendent of Substations, Kansas State Agricultural College, October 1, 1913—.

Office Ag 60; Res. 609 Leavenworth St.

## ARTHUR ROY FEHN, Ph. B.,

*Instructor in Mathematics.*

Ph. B., Baldwin Wallace College, Berea, Ohio, 1903; Instructor in Mathematics, Park College Academy, 1904-1905; Assistant in Biology and Botany, Park College, 1905-1906; Principal, Argos (Indiana) High School, 1907-1908; Principal, Walnut (Illinois) High School, 1908; Assistant Superintendent, *ibid.*, 1909-1910; Graduate Student, University of Chicago, Summer and Fall, 1908, and Summers, 1909, 1910, and 1913; Assistant in Mathematics, Kansas State Agricultural College, 1910-1913; Instructor in Mathematics, *ibid.*, December 1, 1913—.

Office A 70; Res. 821 Humboldt St.

## JOHN GROVER JACKLEY, D. V. M.,

*Instructor in Bacteriology.*

Research Assistant in Bacteriological Laboratory of Pennsylvania State Live Stock Sanitary Board, Philadelphia, 1908-1909; D. V. M., University of Pennsylvania, 1910; Demonstrator and Instructor in Pathological Histology, *ibid.*, 1910-1911; Assistant in Bacteriology, Kansas State Agricultural College, 1911-1913; Instructor in Bacteriology, *ibid.*, December 1, 1913—.

Office V 52; Res. 617 Houston St.

## LOUIS HENRY LIMPER, A. M.,

*Instructor in German.*

A. B., Baldwin Wallace College, Berea, Ohio, 1907; Instructor in German, Berea (Ohio) High School, 1907-1908; Instructor in English, Robert College, Constantinople, 1908-1911; Scholar in Modern Languages, Princeton University, 1911-1912; Graduate Student, University of Chicago, Summer, 1912; Assistant in German and French, University of Denver, 1912-1913; Graduate Student, University of Wisconsin, Summer, 1913; Graduate Student and Assistant in German, *ibid.*, 1913-February 1, 1914; A. M., *ibid.*, January, 1914; Instructor in German, Kansas State Agricultural College, February 1, 1914—.

Office N 61; Res. 111 S. Ninth St.

## PERRY JOHN FREEMAN, B. S.,

*Instructor in Applied Mechanics.*

B. S. in M. E., University of Illinois, 1907; Instructor in Mechanical Engineering, University of Pennsylvania, 1907-1910; Instructor in Machine Construction, and in Charge of Mechanical Engineering Department Shop Laboratories, University of Illinois, 1910-1912; Foreman and Assistant Manager in the Regulator Department, H. Mueller Manufacturing Company, Decatur, Illinois, 1912; Erector of Locomotive Cranes, Browning Engineering Company, Cleveland, Ohio, 1912; Mechanical Engineer, Gullett Cotton Gin Company, Amite, Louisiana, 1913-1914; Instructor in Mechanics, Kansas State Agricultural College, February 1, 1914—.

Office E 32; Res. 831 Leavenworth St.

## SIEBERT LUKE SIMMERING, M. S.,

*Instructor in Steam and Gas Engineering.*

B. S., University of Colorado, 1910; Instructor in Mechanical Engineering, *ibid.*, 1910-1912; Graduate Fellow in Mechanical Engineering, University of Illinois, 1912-1913; Instructor in Industrial Engineering, Pennsylvania State College, 1913-1914; Instructor in Steam and Gas Engineering, Kansas State Agricultural College, March 11, 1914—.

Office S 65; Res. ———.



## FORREST FAYE FRAZIER, C. E.,

*Instructor in Civil Engineering.*<sup>6</sup>

Student, Liberal Arts, Miami University, 1905-1907; Student, Engineering Course, Ohio State University, 1907-1910; C. E., *ibid.*, 1910; Assistant in Engineering Corps, Cincinnati, Hamilton and Dayton Railway, Summer, 1909; Inspector of Concrete Bridges, *ibid.*, 1910; Assistant Superintendent on Excavation and Fill, with Railroad Contractors, 1910-1911; Assistant Engineer on Construction, Pennsylvania Railway, 1911; Assistant in Civil Engineering, Kansas State Agricultural College, 1911-1914; Instructor in Civil Engineering, *ibid.*, 1914—.

Office E 32; Res. 718 Vattier St.

## MYRON RALPH BOWERMAN, B. S.,

*Instructor in Mechanical Drawing and Machine Design.*<sup>6</sup>

B. S., Michigan Agricultural College, 1909; Draftsman, Western Electric Company, Summer, 1909; Assistant in Mechanical Engineering, Kansas State Agricultural College, 1909-1910; Draftsman, Capital Iron Works, Topeka, 1910-1911; Draftsman, Phillips, Long and Company, Chicago, Illinois, 1911; Draftsman, Hanke Iron Works, *ibid.*, 1911-1912; Assistant in Mechanical Drawing and Machine Design, Kansas State Agricultural College, 1912-1914; Instructor in Mechanical Drawing and Machine Design, *ibid.*, 1914—.

Office S 63; Res. 1105 Vattier St.

## GRAYSON BELL McNAIR, B. S.,

*Instructor in Electrical Engineering.*<sup>6</sup>

B. S., Purdue University, 1908; Assistant to Consulting Engineer, Louisville, Kentucky, 1908-1909; in Charge of Transformer Testing Department, Wagner Electric Manufacturing Company, St. Louis, Missouri, 1909-1913; Assistant in Mathematics, Kansas State Agricultural College, May 1 - July 1, 1913; Assistant in Electrical Engineering, *ibid.*, July 1, 1913-1914; Instructor in Electrical Engineering, *ibid.*, 1914—.

Office C 33; Res. 1324 Laramie St.

## INA EMMA HOLROYD, B. S.,

*Assistant in Mathematics.*

B. S., Kansas State Agricultural College, 1897; Graduate, Kansas State Normal School, 1899; Graduate Student, Harvard University, Summer School, 1905; Graduate Student, Cornell University, Summer School, 1911; Assistant in Mathematics, Kansas State Agricultural College, 1900—.

Office G 28; Res. 1001 Moro St.

## CHARLES YOST,

*Assistant in Machine Shop.*

Assistant in Heat and Power Department, Kansas State Agricultural College, 1902-1903; Operating Engineer for Lee Electric Light Company, Superior, Nebraska, 1904; Assistant in Heat and Power Department, Kansas State Agricultural College, 1905-1910; Foreman of Boiler Room, *ibid.*, 1910-1912; Assistant in Machine Shop, *ibid.*, 1912—.

Office S 32; Res. 1230 Laramie St.

## JOHN THOMPSON PARKER,

*Assistant in Woodwork.*

Student, Lakin High School, 1897; Graduate, Apprentice Course in Woodwork, Kansas State Agricultural College, 1902; Carpenter, 1902-1904; Farmer, 1904-1905; Assistant in Woodwork, Kansas State Agricultural College, 1906—.

Office S 26; Res. 926 Vattier St.

## HUGH OLIVER,

*Assistant in Heat and Power Distribution.*

Apprentice, Heat and Power Department, Kansas State Agricultural College, 1902-1903; Assistant in Heat and Power Department, *ibid.*, 1906-1912; Assistant in Heat, Water and Gas Distribution, *ibid.*, 1912-1914; Assistant in Heat and Power Distribution, *ibid.*, 1914—.

Office S 34; Res. 1126 Kearney St.

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6. Effective September 1, 1914.

## JESSIE ANNABERTA REYNOLDS, A. B.,

*Assistant in History and Civics.*

A. B., University of Kansas, 1905; B. S., Kansas State Agricultural College, 1906; Graduate Student, University of Kansas, Summers, 1905 and 1906; Graduate Student, University of Chicago, Summers, 1907 and 1910; Travel-study in Europe, Summers, 1909 and 1912; Assistant in History and Civics, Kansas State Agricultural College, 1906—.  
Office G 32; Res. 1205 Blumont Ave.

## CHESTER ALLEN ARTHUR UTT, M. S.,

*Assistant in Food Analysis.*

B. S., Cornell College, 1903; Graduate Student, State University of Iowa, 1903-1904; Instructor, Keokuk (Iowa) High School, 1904-1907; Graduate Student, State University of Iowa, Summer, 1907; M. S., Cornell College, 1909; Graduate Student, Kansas State Agricultural College, 1913-1914; Assistant in Food Analysis, *ibid.*, 1907—; Assistant Chemist, Kansas State Board of Health, 1907—; Assistant Chemist, Kansas State Dairy Commission, 1907—.  
Office W 30; Res. 1209 Vattier St.

## CLAUDE CARROLL CUNNINGHAM, B. S.,

*Assistant in Coöperative Experiments.*

B. S., Kansas State Agricultural College, 1903; Graduate Student, *ibid.*, 1904; Graduate Student, Cornell University, 1906; Special Assistant in Agronomy, Kansas State Agricultural College, 1907-1908; Assistant in Agronomy, Fort Hays Branch Experiment Station, 1908-1911; Assistant in Coöperative Experiments, Kansas State Agricultural College, 1912—.  
Office Ag 59; Res. 1018 Laramie St.

BURTON SYLVESTER ORR,<sup>1</sup> B. S.,*Assistant in Power and Experimental Engineering; Superintendent of Power Plant.*

B. S., Kansas State Agricultural College, 1907; in Engineering Department, Swift and Company, St. Joseph, Missouri, 1907-1908; Assistant in Mechanical Engineering, Kansas State Agricultural College, 1908-1910; Assistant in Power and Experimental Engineering, *ibid.*, 1910—; Superintendent of Power Plant, *ibid.*, 1912 - November 1, 1913.

ELMER JOHNSON,<sup>1</sup> B. S.,*Assistant in Power and Experimental Engineering.*

B. S., Kansas State Agricultural College, 1908; Assistant in Mechanical Engineering, *ibid.*, 1908-1910; Assistant in Power and Experimental Engineering, *ibid.*, 1910 - February 1, 1914.

## RAYMOND CLIFFORD WILEY, B. S.,

*Assistant Chemist, Agricultural Experiment Station.*

B. S., Oklahoma College of Agriculture and Mechanic Arts, 1905; Assistant Chemist, Maryland Agricultural Experiment Station, 1905-1908; Assistant Chemist, Agricultural Experiment Station, Kansas State Agricultural College, 1908—.  
Office W 30; Res. 711 Humboldt St.

## THOMAS POWELL HASLAM, B. S.,

*Assistant in Veterinary Medicine, Agricultural Experiment Station.*

B. S., Kansas State Agricultural College, 1908; Assistant Instructor in Chemistry, University of Kansas, 1908-1909; M. S., *ibid.*, 1910; Assistant in Veterinary Medicine, Agricultural Experiment Station, Kansas State Agricultural College, 1909—.  
Office V 2; Res. 623 N. Manhattan Ave.

## AMY ALENA ALLEN, B. S.,

*Assistant in Printing.*

Apprentice in Department of Printing, Kansas State Agricultural College, Summer, 1900; Student Assistant, *ibid.*, 1901-1904; B. S., Kansas State Agricultural College, 1904; Proof-reader, Department of Printing, *ibid.*, 1904-1909; Assistant in Printing, *ibid.*, 1909—.  
Office K 28; Res. 1452 Fairchild Ave.

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1. Resigned.

JESSIE GULICK,

*Assistant Cataloguer in Library.*

Instructor, Kansas Public Schools, 1899-1901 and 1903-1905; Instructor, Virginia Public Schools, 1901-1903; Chief Clerk, Division of College Extension, Kansas State Agricultural College, 1907-1909; Assistant in Library, *ibid.*, 1909-1911; Assistant Cataloguer in Library, *ibid.*, 1911—.  
Office F 28; Res. 1622 Osage St.

ADA MARIE BAUM,

*Assistant in Music.*

Student, Chicago Musical College, 1899 and 1903-1904; Assistant in Music, Kansas State Agricultural College, 1909—.  
Office M 29; Res. 822 Poyntz Ave.

ETHEL KATE MAY PING,<sup>1</sup>

*Assistant in Music.*

Graduate, Sherwood Music School, Chicago, 1909; Assistant in Music, Kansas State Agricultural College, 1909-January 1, 1914.

JOHN WILLARD CALVIN,<sup>1</sup> B. S.,

*Assistant Chemist, Agricultural Experiment Station.*

B. S., Kansas State Agricultural College, 1906; Graduate Student and Student Assistant in Department of Chemistry, *ibid.*, 1906-1908; Assistant Expert in Animal Nutrition, United States Department of Agriculture, and Assistant in Animal Nutrition, Pennsylvania State College, 1908-1910; Assistant Chemist (Animal Nutrition), Agricultural Experiment Station, Kansas State Agricultural College, 1910-February 1, 1914.

ALANSON LOLA HALLSTED, B. S.,

*Assistant in Dry Farming, in Coöperation with United States Department of Agriculture.*

B. S., Kansas State Agricultural College, 1903; in General Farming and Coöperative Work with Agronomy Department, Kansas State Agricultural Experiment Station, 1904-1909; Special Agent, Bureau of Plant Industry, United States Department of Agriculture, 1909-1910; Assistant in Dry Farming in Coöperation with United States Department of Agriculture, Fort Hays Branch Agricultural Experiment Station, 1910—.  
Office and Res., Hays, Kansas.

CLARE LAVON BIDDISON, B. S.,

*Assistant in Vocal Music.*

B. S., Kansas State Agricultural College, 1907; Graduate Student in Music, *ibid.*, 1907-1908; Student Assistant in Vocal Music, *ibid.*, 1908-1909; Graduate Student, Cosmopolitan School of Music, Chicago, Summers, 1910 and 1912; Assistant in Vocal Music, Kansas State Agricultural College, 1910—.  
Office M 80; Res. 1001 Humboldt St.

ELLERY FRANKLIN CHILCOTT,<sup>1</sup> B. S.,

*Superintendent Garden City Branch Agricultural Experiment Station.*

B. S., South Dakota State College, 1906; Assistant in Dry Land Agriculture, United States Department of Agriculture, Edgeley (North Dakota), Amarillo (Texas), and Garden City (Kansas), 1906-1911; Superintendent, Garden City Branch Agricultural Experiment Station, 1911-March 1, 1914.

ARTHUR LYNN HARRIS,

*Assistant in Power Plant.*

Fireman, Kansas State Agricultural College, 1908-1909; Student, *ibid.*, 1909-1910; Assistant in Heat and Power, *ibid.*, 1910-1914; Assistant in Power Plant, *ibid.*, 1914—.  
Office E 27; Res. 514 N. Manhattan Ave.

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1. Resigned.

ALBERT RICHARD LOSH, B. S.,

*Assistant State Engineer, Division of College Extension.*

Instructor in Bureau of Education, Philippine Islands, 1904-1907; Student, Philippine School of Arts and Trades, 1906; B. S., Kansas State Agricultural College, 1910; Graduate Student, Massachusetts Institute of Technology, 1914; Assistant State Engineer, Division of College Extension, Kansas State Agricultural College, 1910—.  
Office A 5; Res. 800 Fremont St.

CHARLES ERNEST MILLAR, M. S.,

*Assistant in Soils.*

B. S., University of Illinois, 1909; Assistant in Chemistry, *ibid.*, 1909-1910; Assistant Chemist, Illinois State Water Survey, 1910; Assistant in Chemistry, Kansas State Agricultural College, 1910; M. S., University of Illinois, 1911; Assistant Chemist (Soil Analysis), Agricultural Experiment Station, Kansas State Agricultural College, 1911-July 1, 1913; Assistant in Soils, *ibid.*, July 1, 1913—.  
Office Ag. 60; Res. 1215 Vattier St.

GEORGE ELLSWORTH RABURN, M. S.,

*Assistant in Physics.*

Graduate, Kansas State Normal School, 1905; A. B., University of Michigan, 1907; Graduate Student, *ibid.*, 1912-1913; M. S., *ibid.*, 1913; Assistant in Physics, Kansas State Agricultural College, 1910—.  
Office C 61; Res. 1800 Poyntz Ave.

FRANK CARL GUTSCHE, B. S.,

*Assistant in Chemistry.*

B. S., University of Minnesota, 1910; Night Chemist, Carver County Sugar Company, Chaska, Minnesota, Campaign of 1910; Assistant in Chemistry, Kansas State Agricultural College, 1911—.  
Office C 64; Res. 815 Poyntz Ave.

BRUCE STEINHOFF WILSON, B. S.,

*Assistant in Coöperative Experiments.*

B. S., Kansas State Agricultural College, 1908; Farm Foreman, Kansas State Agricultural College, 1910-1911; Assistant in Agronomy and Foreman of Experimental Farm, *ibid.*, 1911-1912; Assistant in Coöperative Experiments, *ibid.*, 1912—.  
Office Ag 59; Res. 520 N. Manhattan Ave.

DAVID ERNEST LEWIS, B. S.,

*Assistant in Horticulture.*

B. S., Kansas State Agricultural College, 1910; Graduate Student, *ibid.*, 1910-1911; Assistant in Horticulture, *ibid.*, 1911—.  
Office H 32; Res. 1020 Osage St.

BURR HOWEY OZMENT,

*Band Leader.*

Band-master, Baker University, 1900-1903; Band-master, University of Missouri, 1904-1910; Band Leader, Kansas State Agricultural College, 1911—.  
Office N 54; Res. 913 Laramie St.

WARREN LALE BLIZZARD, B. S.,

*Assistant in Animal Husbandry.*

B. S., Kansas State Agricultural College, 1910; Manager of Stock Farm, 1910-1911; Assistant in Animal Husbandry, Kansas State Agricultural College, October, 1911—.  
Office Ag 13; Res. 930 Laramie St.

ASHER EULESTA LANGWORTHY, Ph. C.,

*State Feeding-Stuffs Inspector, Agricultural Experiment Station.*

Ph. C., University of Kansas, 1901; in Commercial Work, 1901-1912; State Feeding-stuffs Inspector, Agricultural Experiment Station, Kansas State Agricultural College, August 15, 1912—.  
Office Ag 28; Res. 815 Poyntz Ave.

## WALTER GOLDSBERRY ALLEE, B. S.,

*Assistant in Physics.*

B. S., Earlham College, 1908; Instructor, Parke County (Indiana) Public Schools, 1908-1905; Principal of Ward School and Director of Athletics, Rockville (Indiana) City Schools, 1905-1907; Instructor and Director of Athletics, Hammond (Indiana) High School, 1908-1911; Graduate Student, University of Chicago, Summers, 1911 and 1912; Instructor and Director of Athletics, Sioux City (Iowa) High School, 1911-1912; Assistant in Physics, Kansas State Agricultural College, 1912—.  
Office C 86; Res. 1612 Laramie St.

## LEILA DUNTON, M. S.,

*Assistant in Milling Industry.*

B. S., Kansas State Agricultural College, 1910; M. S., *ibid.*, 1912; Assistant in Milling Industry, *ibid.*, 1912—.  
Office Ag 40; Res. 804 Moro St.

## LOUISE FEWELL,

*Assistant in Domestic Art.*

Student, Winthrop Normal and Industrial College, Rock Hill, South Carolina, 1907-1911; Student, Teachers' College, Columbia University, 1911-1912; Assistant in Domestic Art, Kansas State Agricultural College, 1912—.  
Office L 65; Res. 1021 Houston St.

## OLIVER MORRIS FRANKLIN, D. V. M.,

*Assistant in Veterinary Medicine.*

D. V. M., Kansas State Agricultural College, 1912; Assistant in Veterinary Medicine, *ibid.*, 1912—.  
Office V 2; Res. 1630 Houston St.

## HELEN LOUISE GREEN,

*Assistant in Domestic Science.*

Graduate Student in Household Economics, Simmons College, 1910-1912; Instructor of Evening Classes, North Bennett Street Industrial School, Boston, Massachusetts, 1911-1912; Graduate Student, Teachers' College, Columbia University, Summer, 1912; Assistant in Domestic Science, Kansas State Agricultural College, 1912—.  
Office L 42; Res. 910 Fremont St.

## CHARLES FRANKLIN HOLLADAY,

*Assistant in Physical Education.*

Graduate, Commercial College, Baker University, 1908; Student, Academic Department, *ibid.*, 1908-1910; Student Assistant in Gymnasium, *ibid.*, 1907-1910; Student, Normal School of Physical Training, Battle Creek, Michigan, Summer, 1913; Assistant in Physical Education, Kansas State Agricultural College, 1912—.  
Office N 37; Res. 171 Anderson Ave.

## WALTER JACOB KING, B. S.,

*Assistant Engineer, Division of College Extension.*

B. S., Kansas State Agricultural College, 1909; Superintendent of Trades School, Kansas State Industrial Reformatory, Hutchinson, 1909-1912; Fellow in Engineering, Kansas State Agricultural College, 1912-1913; Assistant Engineer, Division of College Extension, *ibid.*, 1913—.  
Office A 5; Res. 1616 Fairchild Ave.

ADAH LEWIS,<sup>1</sup> M. S.,*Lecturer on Home Economics, Division of College Extension.*

B. S., Kansas State Agricultural College, 1907; M. S., *ibid.*, 1909; Temporary Assistant in Chemistry, 1907-1911; Dietitian, Ottumwa (Iowa) City Hospital, Fall, 1911; in Charge of Girls' Home Economics Clubs, Division of College Extension, Kansas State Agricultural College, 1912-1913; Lecturer on Home Economics, Division of College Extension, *ibid.*, 1913 - March 1, 1914.  
Office A 35; Res. 1018 Laramie St.

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1. Resigned.

JOHN D LEWIS, B. S.,

*Assistant in Animal Husbandry.*

Student, Edinboro (Pennsylvania) State Normal School, 1906; Instructor, Pennsylvania Public Schools, 1906-1907; B. S., Pennsylvania State College, 1912; Assistant in Animal Husbandry, Kansas State Agricultural College, 1912—.  
Office Ag 13; Res. 815 Poyntz Ave.

JAMES WALKER MCCOLLOCH, B. S.,

*Assistant in Entomology.*

Special Field Agent, Department of Entomology, Kansas State Agricultural College, 1910-1912; B. S., *ibid.*, 1912; Assistant in Entomology, *ibid.*, 1912—.  
Office F 55; Res. 1201 Blumont Ave.

ADOLPH HENRY MEYER,<sup>1</sup> B. S.,

*Assistant in Mathematics.*

B. S., Columbia University, 1911; Assistant in Mathematics, Kansas State Agricultural College, 1912 - September 15, 1913.

WILLIAM HENRY SANDERS, B. S.,

*Assistant in Farm Motors.*

B. S., Kansas State Agricultural College, 1890; Carpenter, Lake Worth, Florida, 1890-1893; Engineer and Contractor, Reclamation Work, Palm Beach, Florida, 1893-1895, 1900-1902; Marine Steam and Gas Engineer, Lake Worth, Florida, 1895-1900; Foreman of Construction Work, West Palm Beach, Florida, 1902-1905; Marine Gas Engineer, Railway Extension, Miami, Florida, 1905-1906; in Dredging Work and Canal Construction, Florida, 1907-1912; Assistant in Power and Experimental Engineering, Kansas State Agricultural College, 1912-1914; Assistant in Farm Motors, *ibid.*, 1914—.  
Office E 3; Res. 826 Osage St.

FLORENCE SNELL, B. S.,

*Lecturer on Domestic Science, Division of College Extension.*

Instructor, Kansas Public Schools, 1905-1908; B. S., Kansas State Agricultural College, 1911; Instructor in Domestic Science and Art, Atchison County High School, 1911-1912; Lecturer on Domestic Science, Division of College Extension, Kansas State Agricultural College, 1912—.  
Office A 35; Res. 1018 Laramie St.

ANNA WALLER WILLIAMS, A. M.,

*Assistant in Domestic Science.*

A. B., University of Illinois, 1907; A. M., *ibid.*, 1912; Assistant in Domestic Science, Kansas State Agricultural College, 1912—.  
Office L 42; Res. 502 Osage St.

WILLIAM ARMFIELD BOYS, B. S.,

*District Demonstration Agent, West Central Kansas, Division of College Extension.*

B. S., Kansas State Agricultural College, 1904; Farmer, Lee's Summit, Missouri, 1904-1906; Farmer, Goodland, Kansas, 1906-1911; Assistant Cerealists, University of California, 1911-1912; District Demonstration Agent, West Central Kansas, Division of College Extension, Kansas State Agricultural College, October, 1912—.

HARLEY JAMES BOWER,<sup>4</sup> B. S., A. M.,

*District Demonstration Agent, Southeastern Kansas, Division of College Extension.*

B. S., Kansas State Agricultural College, 1910; Graduate Student and Assistant in Soils, Ohio State University, 1910-1912; A. M., *ibid.*, 1912; Agronomist, Connecticut Experiment Station, 1912-1913; District Demonstration Agent, Southeastern Kansas, Division of College Extension, Kansas State Agricultural College, February, 1913—.

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1. Resigned.

4. In cooperation with the United States Department of Agriculture.

## GEORGE SELICK KNAPP,

*Assistant in Steam and Gas Engineering.*

Assistant in Machine Shops, Highland Park College, 1908-1910; Instructor in Steam and Gas Engines, *ibid.*, 1910-1913; Assistant in Gas Engineering, Kansas State Agricultural College, February 15, 1913-1914; Assistant in Steam and Gas Engineering, *ibid.*, 1914—.

Office E 3; Res. 815 Poyntz Ave.

## ROLLA WOODS MILLER, A. B.,

*Assistant in Chemistry.*

A. B., Wabash College, 1913; Assistant in Chemistry, *ibid.*, 1911-1913; Assistant in Chemistry, Kansas State Agricultural College, February 25, 1913—.

Office W 26; Res. 815 Poyntz Ave.

## OLIVER CARLTON MILLER,

*Deputy Feeding-Stuffs Inspector.*

With Operating and Auditing Departments, Chicago, Burlington and Quincy Railroad Company, 1892-1913; Deputy Feeding-stuffs Inspector, Agricultural Experiment Station, Kansas State Agricultural College, June 1, 1913—.

Office Ag 28; Res. 407 Leavenworth St.

KARL BRYANT MUSSER,<sup>1</sup> B. S.,*Deputy State Dairy Commissioner.*

B. S., Kansas State Agricultural College, 1912; Deputy State Dairy Commissioner, June 10 - September 10, 1913.

## ROBERT KLINE BONNETT, B. S.,

*Assistant in Farm Crops.*

B. S., Kansas State Agricultural College, 1913; Assistant in Farm Crops, *ibid.*, July 1, 1913—.

Office Ag 77; Res. 1001 Moro St.

## FREDERICK ALFRED WIRT, B. S.,

*Assistant in Farm Mechanics.*

B. S., University of Nebraska, 1913; Student Assistant in Applied Mechanics, *ibid.*, 1912-1913; Assistant in Farm Mechanics, Kansas State Agricultural College, July 1, 1913—.

Office R 27; Res. 815 Poyntz Ave.

## JAMES PLUMMER POOLE, B. S.,

*Assistant in Botany.*

B. S., University of Maine, 1912; Instructor in Botany, Washburn College, 1912-1913; Assistant in Botany, Kansas State Agricultural College, August 1, 1913—.

Office H 51; Res. 109 N. Ninth St.

## FRED SAWYER MERRILL, B. S.,

*Assistant in Horticulture.*

B. S., Massachusetts Agricultural College, 1912; Assistant in Horticulture, Extension Department, *ibid.*, 1911-1912; Assistant to State Entomologist, Kansas State Entomological Commission, 1912-1913; Horticulturalist, Division of College Extension, Kansas State Agricultural College, March 1 - May 15, 1913; Assistant in Horticulture, *ibid.*, 1913—.

Office H 32; Res. 913 Osage St.

## ELSIE ADAMS, B. S.,

*Assistant in Library.*

B. S., Kansas State Agricultural College, 1913; Assistant in Library, *ibid.*, 1913—.

Office F 32; Res. 1527 Leavenworth St.

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1. Resigned.

EDITH ALLEN, A. B.,

*Lecturer on Home Economics, Division of College Extension.*

A. B., University of Illinois, 1913; Institute Lecturer for Illinois Farmers' Institutes, 1907-1913; Graduate Student, University of Illinois, 1913; Lecturer on Home Economics, Division of College Extension, Kansas State Agricultural College, 1913—.  
Office A 85; Res. Park Place.

GRACE CUSHING AVERILL,

*Assistant in Drawing.*

Graduate, Wisconsin State Normal School, 1906; Graduate Student of Manual Arts, *ibid.*, 1909-1910; Graduate Student and Student Assistant in Mechanical Drawing, Bradley Polytechnic Institute, Peoria, Illinois, 1910-1912; Instructor in Manual Arts, Anaheim (California) Public Schools, 1912-1913; Assistant in Drawing, Kansas State Agricultural College, 1913—.  
Office A 80; Res. 203 N. Fourteenth St.

EDNA MAY BAIRD,

*Assistant in Music.*

Student, Bethany College, Lindsborg, Kansas, 1911-1912; Student, Moody Institute, Chicago, Illinois, 1912; Graduate, American Conservatory of Music, Chicago, 1913; Assistant in Music, Kansas State Agricultural College, 1913—.  
Office M 53; Res. 1021 Houston St.

WILLIAM HENRY BALL,

*Assistant in Woodwork.*

Student, Salt City Business College, Winters, 1904-1906; Apprentice Carpenter, 1902-1907; with Gauze and Minor, Haviland, Kansas, 1907-1909; with H. N. Duckworth, Pratt, Kansas, 1909-1911; Instructor in Manual Training, Pratt High School, 1911-1913; Assistant in Woodwork, Kansas State Agricultural College, 1913—.  
Office S 26; Res. 1006 Bluemont St.

HAROLD ROSS BRAKEMAN,

*Assistant in Woodwork.*

Student, Northwestern State Normal School, Edinboro, Pennsylvania, 1906-1908; Carpenter Apprentice, Franklin, Pennsylvania, 1908-1910; Assistant Foreman of Construction, Lake Shore and Michigan Southern Railway, 1910-1911; Building Contractor, 1911-1912; Manager, Longbeach (Mississippi) Sawmill Company, 1912-1913; Assistant in Woodwork, Kansas State Agricultural College, 1913—.  
Office S 26; Res. 1201 Bluemont Ave.

BERTHA EDITH BUXTON, B. S.,

*Assistant in Domestic Art.*

B. S., Ohio State University, 1913; Student Assistant in Domestic Science and Art, *ibid.*, 1912-1913; Assistant in Domestic Art, Kansas State Agricultural College, 1913—.  
Office L 64; Res. 414 N. Juliette Ave.

ROBERT VERNON CHRISTIAN, D. V. M.,

*Superintendent of Serum Production.*

D. V. M., Kansas State Agricultural College, 1911; Assistant in Serum Work, *ibid.*, 1911-1912; Superintendent of Serum Production, *ibid.*, 1913—.  
Office V 27; Res. 617 Houston St.

JENNIE LYNN COX, B. S.,

*Assistant in Domestic Science.*

A. B., Fairmount College, 1903; Graduate Student, University of Chicago, Summer, 1903; Instructor, Fairmount College, 1903-1911; B. S., Kansas State Agricultural College, 1913; Assistant in Domestic Science, *ibid.*, 1913—.  
Office L 42; Res. 724 Houston St.

MAYMIE DAVIS, B. S.,

*Assistant in Domestic Science.*

B. S., Ohio State University, 1913; Assistant in Domestic Science, Kansas State Agricultural College, 1913—.  
Office L 42; Res. 723 Houston St.



## HARRY ELKINS DODGE, B. S.,

*Assistant in Dairying, Fort Hays Branch Agricultural Experiment Station.*

B. S., Kansas State Agricultural College, 1913; Assistant in Dairying, Fort Hays Branch Agricultural Experiment Station, 1913—.  
Office and Res. Hays, Kansas.

## EMMA FLORA FECHT,

*Assistant in Domestic Art.*

Student, Kansas State Manual Training Normal School, Summers, 1905-1907; Student, Stout Institute, Summers, 1908-1910; Graduate, Bradley Polytechnic Institute, 1912; Assistant in Domestic Art, Kansas State Agricultural College, 1913—.  
Office L 65; Res. 1415 Fairchild Ave.

## CLEMENS INKS FELPS, B. S.,

*Assistant in Highway Engineering, Division of College Extension.*

B. S., Kansas State Agricultural College, 1912; Assistant in Highway Engineering, Division of College Extension, Kansas State Agricultural College, 1913—.  
Office A 5; Res. 1006 Fremont St.

## GRACE AGNES FERREE, B. S.,

*Assistant in Domestic Art.*

B. S., Ohio State University, 1911; Assistant in Domestic Art, *ibid.*, 1911-1912; Assistant in Domestic Art, Kansas State Agricultural College, 1913—.  
Office L 65; Res. 723 Houston St.

## RAY GATEWOOD, B. S.,

*Assistant in Animal Husbandry.*

B. S., Iowa State College, 1913; Assistant in Animal Husbandry, Kansas State Agricultural College, 1913—.  
Office Ag 13; Res. 714 Poyntz Ave.

## ROBERT GETTY, B. S. A.,

*Assistant in Forage Crops,<sup>4</sup> Fort Hays Branch Agricultural Experiment Station.*

B. S. A., University of Nebraska, 1913; Assistant in Forage Crops, Fort Hays Branch Agricultural Experiment Station, 1913—.  
Office and Res., Hays, Kansas.

## GRACE GLASGOW, M. S.,

*Assistant in Bacteriology.*

B. S., University of Illinois, 1912; M. S., *ibid.*, 1912; Graduate Student, *ibid.*, 1912-1913; Assistant in Bacteriology, Kansas State Agricultural College, 1913—.  
Office V 54; Res. 203 Park Road.

## EDITH ELIZABETH HAGUE, A. B.,

*Assistant in Library.*

A. B., University of Kansas, 1910; Graduate Student, Illinois Library School, 1912-1913; Assistant in Library, Kansas State Agricultural College, 1913—.  
Office F 28; Res. 515 Laramie St.

## MELVA DELIA HARKER, B. S.,

*Assistant in Domestic Science.*

B. S., University of Wisconsin, 1913; Assistant in Domestic Science, Kansas State Agricultural College, 1913—.  
Office L 42; Res. Humboldt St.

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4. In coöperation with the United States Department of Agriculture.

ERWIN WILLIAM HENRY,<sup>5</sup>*Assistant in Blacksmithing.*

Apprentice to General Blacksmith, 1908-1913; Blacksmith, Blue Rapids Machine Shop, 1913; Assistant in Blacksmithing, Kansas State Agricultural College, 1913—.  
Office S 38; Res. 1414 Houston St.

## ARAMINTA HOLMAN,

*Assistant in Drawing.*

Graduate, Kansas State Normal School, 1890; Instructor, Leavenworth Public Schools, 1891-1904; Principal, *ibid.*, 1904-1909; Art Instructor, Leavenworth County Institute, 1901, 1904; Graduate, New York School of Fine and Applied Art, 1910; Instructor, *ibid.*, 1910-1911; Instructor in Art, Kansas State Normal School, Summer, 1910, and Spring Term, 1913; Instructor in Art, State-Wide Institute, *ibid.*, 1913; Assistant in Drawing, Kansas State Agricultural College, 1913—.  
Office A 67; Res. 1005 Humboldt St.

## GARNET LEONE HUTTO,

*Assistant in Physical Education for Women.*

Student, Harvard Summer School, 1913; Assistant in Physical Training for Women, Kansas State Agricultural College, 1913—.  
Office N 8; Res. 923 Vattier St.

## ETHEL HANNAH JONES, B. S.,

*Assistant in Domestic Art.*

Student, Smith College, 1906-1908; Graduate, Pratt Institute, 1910; Instructor, Scranton (Pennsylvania) Evening Technical High School, 1911-1912; B. S., Columbia University, 1913; Graduate, Teachers' College, *ibid.*, 1913; Assistant in Domestic Art, Kansas State Agricultural College, 1913—.  
Office L 64; Res. 1415 Fairchild Ave.

## FREDERIC ARTHUR KIENE, B. S.,

*Assistant in Cereal Crops,<sup>4</sup> Fort Hays Branch Agricultural Experiment Station.*

B. S., Kansas State Agricultural College, 1906; Newspaper Work and General Farming, 1906-1912; Assistant in Cereal Crops, Fort Hays Branch Agricultural Experiment Station, 1912—.  
Office and Res., Hays, Kansas.

## JOSEPH IRL KIRKPATRICK, D. V. M.,

*Assistant in Hog-Cholera Serum Production.*

D. V. M., Kansas State Agricultural College, 1913; Instructor, Sedgwick County Schools, 1908-1909, 1911-1912; Assistant in Hog-cholera Serum Production, Kansas State Agricultural College, 1913—.  
Office V 30; Res. ———.

## WILLIAM ALBERT LATHROP,

*Assistant in Blacksmithing.*

Student of Mechanical Engineering, Kansas State Agricultural College, 1910-1913; Assistant in Blacksmithing, *ibid.*, 1913—.  
Office S 38; Res. 601 Vattier St.

## ERWIN JONES MONTAGUE, B. S.,

*Assistant to Superintendent, Fort Hays Branch Agricultural Experiment Station.*

B. S., Oregon Agricultural College, 1913; Assistant to Superintendent, Fort Hays Branch Agricultural Experiment Station, 1913—.  
Office and Res. Hays, Kansas.

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4. In coöperation with the United States Department of Agriculture.

5. Temporary appointment.

## FRED WINFIELD MOSSMAN,

*Assistant in Power Plant.*

Foreman of Boiler Room, Kansas State Agricultural College, 1911-1913; Assistant in Heat and Power, *ibid.*, 1913-1914; Assistant in Power Plant, *ibid.*, 1914—.  
Office E 3; Res. 519 N. Manhattan Ave.

## RAY V MURPHY, B. S.,

*Assistant in Chemistry.*

B. S., Illinois Wesleyan University, 1912; Undergraduate Instructor in Chemistry, *ibid.*, 1910-1911; Soil, Water and Fertilizer Analyst, *ibid.*, 1910-1912; Instructor in Science, Genesee (Illinois) Collegiate Institute, Summer, 1912; Instructor in Science, Genoa (Illinois) High School, 1912-February, 1913; Principal, Marengo (Illinois) High School, February to June, 1913; Assistant in Chemistry, Kansas State Agricultural College, 1913—.  
Office W 26; Res. 520 Poyntz Ave.

## FRED FARWELL PIPER, B. S.,

*Assistant in Physics.*

B. S., Tufts College, 1908; Professor of Physics and Engineering, St. Francis Xavier's College, Antigonish, Nova Scotia, 1908-1909; Student Engineer, General Electric Company, 1909-1913; Assistant in Physics, Kansas State Agricultural College, 1913—.  
Office C 39; Res. 811 Poyntz Ave.

## ALICE EDNA SKINNER, B. S.,

*Assistant in Domestic Science.*

B. S., Kansas State Agricultural College, 1909; Assistant in Home Economics, Department of College Extension, *ibid.*, 1910-1911; Instructor in Domestic Science, Fairbury (Nebraska) High School, 1911-1912; Graduate Student, Teachers' College, Columbia University, 1912-1913; Assistant in Domestic Science, Kansas State Agricultural College, 1913—.  
Office L 44; Res. 1203 Laramie St.

## JOHN CLIFFORD SUMMERS, B. S.,

*Assistant Chemist, Agricultural Experiment Station.*

B. S., Clemson Agricultural College, Clemson College, South Carolina, 1906; Assistant Chemist, Agricultural Experiment Station, Louisiana State University, 1906-1909; Graduate Student, *ibid.*, 1908-1909; Assistant Chemist, Agricultural Experiment Station, Purdue University, 1909-1910; Assistant Chemist, Agricultural Experiment Station, Colorado Agricultural College, 1910-1911; Chief Chemist, the Hally Sugar Company, Denver, Colorado, 1911-1913; Assistant Chemist, Agricultural Experiment Station, Texas College of Agriculture and Mechanic Arts, February to September, 1913; Assistant Chemist, Agricultural Experiment Station, Kansas State Agricultural College, 1913—.  
Office C 3; Res. 1630 Leavenworth St.

## PEARLE EBERDINE THOMAS, B. S.,

*Assistant in Domestic Art.*

B. S., University of Missouri, 1911; Student Assistant in Botany, *ibid.*, 1909-1911; Graduate Student, *ibid.*, 1911-1912; Instructor, St. Joseph (Missouri) Central High School, 1912-1913; Assistant in Domestic Art, Kansas State Agricultural College, 1913—.  
Office L 64; Res. 1001 Humboldt St.

## WALTER EDWIN TOMSON, B. S.,

*Assistant in Dairy Husbandry.*

B. S., Kansas State Agricultural College, 1912; with Department of Dairy Husbandry, *ibid.*, 1912-1913; Assistant in Dairy Husbandry, *ibid.*, 1913—.  
Office D 30; Res. 904 Bluemont Ave.

## WALTER AMOS TURNBULL,

*Assistant in Blacksmithing.*

Apprentice to General Blacksmith, 1897-1901; General Blacksmith, 1903-1906; Journeyman Blacksmith, Denver Electric and Gas Company, 1908-1909; Blacksmith with Denver and Rio Grande Railway Company, 1909-1910; Foreman of Blacksmith Shop, Telluride (Colorado) Transfer Company, 1910-1911; Tool Temperer, Liberty Bell Mining Company, Colorado, 1911-1912; General Blacksmith, 1912-1913; Assistant in Blacksmithing, Kansas State Agricultural College, 1913—.  
Office S 38; Res. 916 Pierre St.

## CAROLINE ULRICH,

*Assistant in Domestic Art.*

Graduate, Normal Domestic Art Course, Drexel Institute, Philadelphia, Pennsylvania, 1912; Instructor of Evening Classes, Saginaw (Michigan) Manual Training School, 1912-1913; Assistant in Domestic Art, Kansas State Agricultural College, 1913—.  
Office L 64; Res. 910 Fremont St.

## CHESTER LEE WOODINGTON,

*Assistant in Power Plant.*

With Heat and Light Department, School for the Deaf, Olathe, 1903-1905; with Refrigeration Department, Armour Packing Company, Kansas City, 1905-1910; Steam Fitter with Department of Heat and Power, Kansas State Agricultural College, 1910-1913; Assistant in Heat and Power, *ibid.*, 1913-1914; Assistant in Power Plant, *ibid.*, 1914—.  
Office E 3; Res. 1126 Moro St.

## HARRY BARCLAY YOCOM, A. B.,

*Assistant in Zoölogy.*

A. B., Oberlin College, 1912; Instructor in Zoölogy, Wabash College, 1912-1913; Student, Marine Biological Laboratory, Woods Hole, Massachusetts, Summer, 1913; Assistant in Zoölogy, Kansas State Agricultural College, 1913—.  
Office F 62; Res. 714 Poyntz Ave.

## LEE HAM GOULD, B. S.,

*District Demonstration Agent, Southwest Kansas, Division of College Extension.*

B. S., Kansas State Agricultural College, 1912; Farm Manager and Grain Buyer for W. H. Gould and Sons, 1912-1913; District Demonstration Agent, Southwest Kansas, Division of College Extension, Kansas State Agricultural College, October 1, 1913—.  
Office and Res. Dodge City, Kansas.

## LEO EDWARD MELCHERS, M. S.,

*Assistant Plant Pathologist, Agricultural Experiment Station.*

B. S., Ohio State University, 1912; Student Assistant in Horticultural Extension Schools, *ibid.*, 1911-1912; M. S., *ibid.*, 1913; Assistant Plant Pathologist, Agricultural Experiment Station, Kansas State Agricultural College, October 1, 1913—.  
Office H 56; Res. 900 Leavenworth St.

## ANDREW MINIE PATERSON, B. S.,

*Assistant in Animal Husbandry.*

B. S., Kansas State Agricultural College, 1913; Graduate, School of Agriculture, University of Minnesota, 1910; Assistant in Animal Husbandry, Kansas State Agricultural College, October 1, 1913—.  
Office Ag 13; Res. 121 N. Eighth St.

## STANLEY ALBERT SMITH, B. S.,

*Assistant in Drawing.*

B. S., Kansas State Agricultural College, 1913; Assistant in Drawing, Kansas State Agricultural College, October 1, 1913—.  
Office A 55; Res. 611 Poyntz Ave.

## EDITH ELLEN JONES, B. S.,

*Assistant to the Dean of the Division of Agriculture.*

B. S., Kansas State Agricultural College, 1909; Secretary to Department of Agronomy, *ibid.*, 1909-October 15, 1913; Assistant to the Dean of the Division of Agriculture, *ibid.*, October 15, 1913—.  
Office Ag 31; Res. 1224 Fremont St.

## LEWELLYN GAINES HEPWORTH, B. S.,

*Deputy Feeding-Stuffs Inspector.*

B. S., Kansas State Agricultural College, 1897; Deputy Feeding-stuffs Inspector, Agricultural Experiment Station, *ibid.*, October 27, 1913—.  
Res. 1420 Buchanan St., Topeka, Kansas.

FRANK BAXTER LAWTON,<sup>1</sup> B. S.,*Assistant in Farm Mechanics.*

B. S., Kansas State Agricultural College, 1912; Farm Foreman, *ibid.*, 1912-1913; Assistant in Farm Mechanics, *ibid.*, November 1, 1913-March 1, 1914.

## HAROLD MORTON JONES, B. S.,

*Deputy State Dairy Commissioner.*

B. S., Purdue University, 1908; Manager of Indiana Creameries, 1908-1913; Deputy State Dairy Commissioner, November, 1913—  
Office X; Res. 512 Houston St.

## WILLIAM GRISWOLD BEACH, A. B.,

*Assistant in Public Speaking.*

A. B., Harvard University, 1911; Instructor, Manter Hall, Cambridge, Massachusetts, 1909-1910; Private Teaching and Settlement Work, 1911-1913; Concert and Lyceum Work with International Musical Bureau, New York City, 1911-1913; Assistant in Public Speaking, Kansas State Agricultural College, January 1, 1914—  
Office F 8; Res. 1031 Bluemont Ave.

## VINTON VIRGIL DETWILER, B. S.,

*Assistant in Industrial Journalism.*

Instructor in Manual Training, Dickinson County High School, 1911-1912; B. S., Kansas State Agricultural College, 1913; Assistant in Industrial Journalism, *ibid.*, January 1, 1914—  
Office K 51; Res. 613 N. Manhattan Ave.

## RALPH KENNEY, B. S. A.,

*Assistant in Farm Crops.*

B. S. A., Ohio State University, 1912; Assistant in Agronomy, Kentucky State College of Agriculture, and Experiment Station, 1912-December 31, 1913; Assistant in Farm Crops, Kansas State Agricultural College, January 1, 1914—  
Office Ag 82; Res. 617 Houston St.

## FANCHON IDOLINE EASTER,

*Assistant in Music.*

Pupil of Raphael Navos, 1909-1913; Diploma, Institute of Musical Art, Wichita, 1911; Instructor in Piano, Institute of Musical Art, Wellington, 1912-1913; Concert Artist and Instructor in Music, 1913; Assistant in Music, Kansas State Agricultural College, January 20, 1914—  
Office M 52; Res. 611 Humboldt St.

## RUFUS TERRY KENNEDY, D. V. M.,

*Assistant in Veterinary Medicine.*

D. V. M., Ohio State University, 1911; Assistant in Laboratories and Assistant Bacteriologist, Ohio State Board of Health, July, 1911-January, 1913; Private Veterinary Practice, Bucyrus, Ohio, July, 1912-February 1, 1914; Assistant in Veterinary Medicine, Kansas State Agricultural College, February 1, 1914—  
Office V —; Res. —.

## LEWIS LEROY LEEPER,

*Miller, Department of Milling Industry.*

Assistant Miller, Kaw Mills, Topeka, 1907 and 1908; Head Miller, Dwight Mills, Graceville, Minnesota, 1909; Head Miller, Cozad Roller Mills, Cozad, Nebraska, 1910 and 1911; Head Miller and Superintendent, Denton Milling Company, Denton, Texas, 1912; Head Miller and Superintendent, Royal Milling Company, Milliken, Colorado, 1913; Miller, Department of Milling Industry, Kansas State Agricultural College, February 23, 1914—.

## STANLEY PENRHYN CLARK, B. S.,

*Superintendent, Colby Branch Agricultural Experiment Station.*

B. S., Kansas State Agricultural College, 1912; Instructor, Nashwauk (Minnesota) High School, 1912-March 1, 1914; Superintendent, Colby Branch Agricultural Experiment Station, March 1, 1914—  
Office and Res., Colby, Kansas.

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1. Resigned.

## MALCOLM SEWELL, M. S.,

*Superintendent, Garden City Branch Agricultural Experiment Station.*

B. S., Kansas State Agricultural College, 1912; M. S., Ohio State University, January 1, 1914; Superintendent, Garden City Branch Agricultural Experiment Station, March 1, 1914—.

Office and Res., Garden City, Kansas.

## PRESTON ESSEX McNALL, B. S.,

*Fellow in Soils.*B. S. in E. E., Kansas State Agricultural College, 1909; with Pacific Electric Company and Edison Electric Company, Los Angeles, California, 1909-1911; Instructor, Minneapolis High School, 1911-1912; B. S. in Ag., Kansas State Agricultural College, 1913; Fellow in Soils, *ibid.*, 1913—.

Office Ag 60; Res. Y. M. C. A.

## EDWIN HENRY HUNGERFORD, B. S.,

*Fellow in Chemistry.*B. S., Kansas State Agricultural College, 1912; Graduate Student, *ibid.*, 1912-1913; Fellow in Chemistry, *ibid.*, 1913—.

Office C 3; Res. 518 Bluemont Ave.

## LYMAN DALTON LATOURETTE, B. S.,

*Fellow in Farm Crops.*

B. S. A., University of Arizona, 1913; Fellow in Farm Crops, Kansas State Agricultural College, 1913—.

Office Ag 79; Res. 710 N. Manhattan Ave.

## FLOYD PATTISON,

*Fellow in Steam and Gas Engineering.*

B. S., Kansas State Agricultural College, 1912; Employee of Smith Gas Power Company, Lexington, Ohio, 1912-1913; Fellow in Steam and Gas Engineering, Kansas State Agricultural College, 1913—.

Office E 31; Res. 927 Leavenworth St.

## JOHN BEARDSLEY SIEGLINGER, B. S.,

*Fellow in Soils.*

B. S., Oklahoma Agricultural and Mechanical College, 1913; Fellow in Soils, Kansas State Agricultural College, 1913—.

Office Ag 61; Res. 904 Bluemont Ave.

## JAMES THOMAS LARDNER,

*Financial Secretary and Purchasing Agent.*

Student, Kansas Normal College, Fort Scott, 1891-1893; Instructor, Kansas Public Schools, 1893-1896; Student, Kansas State Normal School, 1896-1897; Bookkeeper, Assistant Bank Cashier, and Bank Cashier, 1898-1913; Financial Secretary and Purchasing Agent, Kansas State Agricultural College, 1913—.

Office A 27; Res. 608 Osage St.

## JESSIE McDOWELL MACHIR,

*Registrar.*

Assistant Registrar, University of Kansas, August, 1910-1913; Registrar, Kansas State Agricultural College, 1913—.

Office A 29; Res. 1224 Fremont St.

## BERZELIUS LESLIE STROTHER,

*Superintendent of Printing.*

Master Printer, Raleigh, North Carolina, 1876-1877; Printer and Publisher, 1877-1912; Superintendent of Printing, Kansas State Agricultural College, July 15, 1913—.

Office K 28; Res. 1214 Bluemont Ave.

## ROSCOE TOWNLEY NICHOLS, B. S., M. D.,

*College Physician.*

B. S., Kansas State Agricultural College, 1899; M. D., Northwestern University Medical School, 1902; Private Practice of Medicine, Liberal, Kansas, 1902 - February 1, 1914; College Physician, Kansas State Agricultural College, February 1, 1914—.  
Office A 65; Res. 1025 Humboldt St.

## ROSE THOMPSON, R. N.,

*College Nurse.*

Graduate, Parkview Hospital Training School, Manhattan, June, 1913; R. N., State of Kansas, June, 1913; Hospital and Private Nursing, June, 1913 - January 20, 1914; College Nurse, Kansas State Agricultural College, January 20, 1914—.  
Office A 65; Res. 1307 Poyntz Ave.

WILLIAM RILEY LEWIS,<sup>1</sup>*Custodian.*

Head Janitor, Kansas State Agricultural College, 1899-1908; Custodian, *ibid.*, 1908-January 15, 1914.

## GEORGE FRANKLIN WAGNER, B. S.,

*Custodian.*

B. S., Kansas State Agricultural College, 1899; Custodian, *ibid.*, January 15, 1914—.  
Office A 47; Res. College Campus.

## GUY DAVID NOEL, B. S.,

*Foreman in Charge, Dodge City Branch Agricultural Experiment Station.*

B. S., Kansas State Agricultural College, 1909; Assistant, South Dakota Agricultural Experiment Station, 1909; Instructor, Olathe High School, 1909-1910; Instructor in Science, Dickinson County High School, 1910 - April, 1911; Foreman in Charge, Dodge City Branch Agricultural Experiment Station, April 1, 1911—.  
Office and Res., Dodge City, Kansas.

## FRANCIS JOHN TURNER,

*Foreman, Ogallah Branch Agricultural Experiment Station.*

With Dillon Nursery Company, McLouth, Kansas, 1902-1904; Farmer and Fruit Grower, 1904-1908; Student, Kansas State Agricultural College, 1908-1909; Foreman, Ogallah Branch Agricultural Experiment Station, 1909—.  
Office and Res., Ogallah, Kansas.

## CHARLES ELMER CASSEL, B. S.,

*Foreman, Tribune Branch Agricultural Experiment Station.*

B. S., Kansas State Agricultural College, 1910; Foreman, Tribune Branch Agricultural Experiment Station, 1912—.  
Office and Res., Tribune Kansas.

## GEORGE RICHARD PAULING,

*Engineer of Power Plant.*

Officer in Power Plant, Metropolitan Street Railway, Kansas City, Missouri, 1900-1901; Switchboard Operator, *ibid.*, 1901-1903; Construction Work, General Electric Company, 1903-1904; Student in Night School, Finley Engineering College, 1905-1906; Assistant Engineer of Power Plant, Metropolitan Street Railway, Kansas City Missouri, 1904-1908; Night Engineer, Missouri River Power Plant, *ibid.*, 1908-1911; Chief Engineer, *ibid.*, 1911-1913; Engineer of Power Plant, Kansas State Agricultural College, November 1, 1913—.  
Office E 3; Res. 625 Leavenworth St.

## EDWARD CLAEREN, Commissary Sergeant U. S. A. (Retired),

*Assistant to the Commandant.*

Commissary Sergeant, U. S. A. (Retired); Assistant to the Commandant, Kansas State Agricultural College, 1910—.  
Office N 29; Res. 1125 Peyntz Ave.

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1. Resigned.

WALDO ERNEST GRIMES, B. S.,

*Farm Foreman.*

B. S., Kansas State Agricultural College, 1913; Farm Foreman, *ibid.*, 1913—.  
Office and Res., R. R. 8.

CYRUS EARL BUCHANAN,

*Dairy Herdsman.*

NORTON LEWIS HARRIS,

*Superintendent of Poultry.*

LESLIE ROSS,

*Herdsman.*



## Agricultural Experiment Station

### Officers of the Station

H. J. WATERS, *President of the College.*

#### ADMINISTRATION—

W. M. JARDINE, Director.  
J. T. WILLARD, Vice Director.  
G. E. THOMPSON, General Superintendent of Substations.  
J. T. LARDNER, Financial Secretary.  
E. E. JONES, Executive Clerk.

#### AGRONOMY—

L. E. CALL, in Charge.  
CECIL SALMON, Assistant in Crops.  
C. C. CUNNINGHAM, Assistant in Coöperative Experiments.  
B. S. WILSON, Assistant in Coöperative Experiments.  
R. I. THROCKMORTON, Assistant in Soils.  
C. E. MILLAR, Assistant in Soils.  
R. K. BONNETT, Assistant in Crops.  
RALPH KENNEY, Assistant in Crops.  
W. E. GRIMES, Farm Superintendent.

#### ANIMAL HUSBANDRY—

W. A. COCHEL, in Charge.  
C. W. MCCAMPBELL, Assistant in Horse-Feeding Investigations.  
C. M. VESTAL, Assistant in Animal Nutrition.  
J. D. LEWIS, Assistant in Beef Cattle.  
W. L. BLIZZARD, Assistant in Hogs.  
RAY GATEWOOD, Assistant in Beef Cattle.  
LESLIE ROSS, Herdsman.

#### BACTERIOLOGY—

L. D. BUSHNELL, in Charge.  
O. W. HUNTER, Assistant in Dairy Bacteriology.  
J. G. JACKLEY, Assistant in Poultry Disease Investigations.  
GRACE GLASGOW, Assistant in General Bacteriology.

#### BOTANY—

H. F. ROBERTS, in Charge.  
E. C. MILLER, Assistant in Plant Physiology.  
J. P. POOLE, Assistant in Seed Control and Plant Breeding.  
L. E. MELCHERS, Assistant in Plant Pathology.

#### CHEMISTRY—

J. T. WILLARD, in Charge.  
C. O. SWANSON, Assistant in General Investigations.  
R. C. WILEY, Assistant in Feeding Stuffs and Fertilizers.  
J. W. CALVIN,\* Assistant in Animal Nutrition.  
J. C. SUMMERS, Assistant in Soil Analysis.

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\* Resigned February 1, 1914.

## DAIRY HUSBANDRY—

O. E. REED, in Charge.  
J. B. FITCH, Assistant in Dairy Production.  
W. E. TOMSON, Assistant in Dairy Manufactures.  
G. A. GILBERT, Assistant in Dairy Manufactures.  
G. S. HINE, State Dairy Commissioner.  
H. M. JONES, Deputy State Dairy Commissioner.  
C. E. BUCHANAN, Herdsman.

## ENTOMOLOGY—

G. A. DEAN, in Charge.  
J. H. MERRILL, Assistant in Fruit Insect Investigations.  
P. S. WELCH, Assistant in Staple Crop Insect Investigations.  
J. W. MCCOLLOCH, Assistant in Staple Crop Insect Investigations.

## FORESTRY—

C. A. SCOTT, in Charge.

## HORTICULTURE—

ALBERT DICKENS, in Charge.  
M. F. AHEARN, Assistant in Vegetables and Forcing Crops.  
D. E. LEWIS, Assistant in Diseases of Fruits and Vegetables.  
F. S. MERRILL, Assistant in Cultural Methods and Fertilizer Investigations.

## MILLING INDUSTRY—

L. A. FITZ, in Charge.  
A. E. LANGWORTHY, Assistant in Feed Control.  
LEILA DUNTON, Assistant in Wheat and Flour Investigations.  
O. C. MILLER, Assistant in Feed Control.

## POULTRY HUSBANDRY—

W. A. LIPPINCOTT, in Charge.  
N. L. HARRIS, Superintendent of Poultry Plant.

## VETERINARY MEDICINE—

F. S. SCHOENLEBER, in Charge.  
L. W. GOSS, Assistant in Histology and Pathology.  
T. P. HASLAM, Assistant in Pathology.  
R. V. CHRISTIAN, Assistant in Hog Cholera Serum Manufacture.  
O. M. FRANKLIN, Assistant in Veterinary Medicine.  
J. I. KIRKPATRICK, Assistant in Hog Cholera Serum Manufacture.  
C. W. HOBBS, Field Veterinarian.

## ZOOLOGY—

R. K. NABOURS, in Charge.  
J. E. ACKERT, Assistant in Parasitology.  
H. B. YOCUM, Assistant in Injurious Mammals Investigations.

**Fort Hays Branch Station**

GEORGE K. HELDER, Superintendent.  
A. L. HALLSTED,<sup>4</sup> Assistant in Dry Farming.  
F. A. KIENE,<sup>4</sup> Assistant in Cereal Investigations.  
ROBERT E. GETTY,<sup>4</sup> Assistant in Forage Crop Investigations.

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**Garden City Branch Station**

M. C. SEWELL, Superintendent.  
J. G. LILL,<sup>4</sup> Assistant in Dry Farming.  
\_\_\_\_\_,<sup>4</sup> Assistant in Irrigation Investigations.

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**Dodge City Forestry Station**

F. J. TURNER, Foreman.

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**Tribune Branch Station**

C. E. CASSEL, Foreman.

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**Colby Branch Station**

\_\_\_\_\_, Foreman.

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4. In coöperation with the United States Department of Agriculture.

## **Engineering Experiment Station**

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### **Officers of the Station**

H. J. WATERS, *President of the College.*

#### **ADMINISTRATION—**

A. A. POTTER, Acting Director.  
FANNY DALE, Secretary.

#### **APPLIED MECHANICS AND MACHINE DESIGN—**

R. A. SEATON, in Charge.  
P. J. FREEMAN, Assistant.  
M. R. BOWERMAN, Assistant.

#### **ARCHITECTURE—**

J. D. WALTERS, in Charge.  
F. C. HARRIS, Assistant.

#### **CHEMISTRY—**

J. T. WILLARD, in Charge.  
H. H. KING, Assistant.

#### **CIVIL ENGINEERING—**

L. E. CONRAD, in Charge.  
F. F. FRAZIER, Assistant.

#### **ELECTRICAL ENGINEERING—**

J. O. HAMILTON, in Charge.  
W. C. LANE, Assistant.

#### **HIGHWAY AND IRRIGATION ENGINEERING—**

W. S. GEARHART, in Charge of Highway Engineering.  
H. B. WALKER, in Charge of Irrigation Engineering.

#### **PHYSICS—**

J. O. HAMILTON, in Charge.  
G. E. RABURN, Assistant.

#### **SHOP PRACTICE—**

W. W. CARLSON, in Charge.

#### **STEAM AND GAS ENGINEERING—**

A. A. POTTER, in Charge.  
S. L. SIMMERING, Assistant.  
W. H. SANDERS, Assistant.  
G. S. KNAPP, Assistant.

## The College Cadet Corps

### *Commissioned and Noncommissioned Officers.*

COMMANDANT OF CADETS,  
SECOND LIEUTENANT ROY ALISON HILL, Seventh U. S. Infantry,  
Professor of Military Science and Tactics.

*Assistant to the Commandant,*  
Commissary Sergeant EDWARD CLAEREN, U. S. A. (Retired).

*Band Leader,*  
BURR HOWEY OZMENT.

### CORPS ORGANIZATION.

Lieutenant Colonel .....	O. E. SMITH.
Major, First Battalion .....	P. E. JACKSON.
Major, Second Battalion .....	A. P. IMMENSCHUH.
Captain and Adjutant .....	R. R. LANCASTER.
Captain and Quartermaster .....	T. K. VINCENT.
Lieutenant and Battalion Adjutant .....	J. P. RATHBUN.
Sergeant Major .....	J. S. HAGAN.
Quartermaster Sergeant .....	E. V. PLUSH.
Color Sergeant .....	L. M. MASON.
Color Sergeant .....	FRED STEPHENSON.
Battalion Sergeant Major .....	E. W. SKINNER.
Battalion Sergeant Major .....	E. W. SKINNER.
Chief Trumpeter .....	JOHN W. MUSIL.

#### COMPANY A.

*Captain:*  
J. W. Linn.

*Lieutenant:*  
L. A. Moury.

*First Sergeant:*  
H. R. Summer.

*Quartermaster Sergeant:*  
W. R. Hervey.

*Sergeants:*  
C. A. Fickel.  
W. D. Adair.  
C. L. Swenson.

*Corporals:*  
H. S. Winn.  
C. R. Jaccard.  
G. C. Smith.  
G. M. Shick.  
E. R. Martin.  
E. F. Wilson.

#### COMPANY B.

*Captain:*  
G. A. Russell.

*Lieutenant:*  
C. A. Hooker.

*First Sergeant:*  
J. B. Elliot.

*Quartermaster Sergeant:*  
D. E. Hull.

*Sergeants:*  
R. M. St. John.  
R. F. Mirick.  
J. N. Wilmer.

*Corporals:*  
E. B. Goldsmith.  
W. S. Lay.  
J. M. Aye.  
A. J. Mangelsdorf.  
A. Walker.  
J. E. Denman.

## COMPANY C.

*Captain:*

L. A. Richards.

*Lieutenant:*

E. E. Thompson.

*First Sergeant:*

R. H. Kidd.

*Quartermaster Sergeant:*

G. L. Siefkin.

*Sergeants:*

A. N. Johnson.

H. Tyrell.

O. O. Browning.

*Corporals:*

P. B. Gwin.

G. H. Mulford.

F. A. Unruh.

B. H. Rexroad.

D. D. Bird.

F. N. Jordan.

## COMPANY E.

*Captain:*

O. B. Burtis.

*Lieutenant:*

F. R. Rawson.

*First Sergeant:*

A. E. Hopkins.

*Quartermaster Sergeant:*

G. M. Arnold.

*Sergeants:*

E. Ranney.

A. E. Hylton.

E. J. Otto.

*Corporals:*

P. D. Buchanan.

O. O. Mawry.

I. R. Abel.

J. R. Neale.

H. Miller.

L. N. Henderson.

## COMPANY D.

*Captain:*

T. F. Boise.

*Lieutenant:*

O. R. Walters.

*First Sergeant:*

A. C. Christopherson.

*Quartermaster Sergeant:*

J. M. Arnold.

*Sergeants:*

T. R. Logan.

W. E. Deal.

E. J. Morris.

*Corporals:*

C. T. Bischoff.

J. H. Cushman.

G. L. Usselman.

R. R. Neiswender.

C. F. Lasswell.

W. C. Lyness.

## COMPANY F.

*Captain:*

P. L. Mize.

*Lieutenant:*

R. O. Deming.

*First Sergeant:*

R. J. Montgomery.

*Quartermaster Sergeant:*

R. Ramsey.

*Sergeants:*

G. W. FitzGerald.

W. L. Wilhoite.

E. F. Shaw.

*Corporals:*

P. Carnahan.

H. W. Lunnow.

H. Green.

D. C. Scott.

F. M. Pickerell.

C. B. Howe.

COMPANY G.

*Captain:*  
G. L. Farmer.  
*Lieutenant:*  
V. E. Bundy.  
*First Sergeant:*  
H. B. Linscott.  
*Quartermaster Sergeant:*  
C. H. Zimmerman.  
*Sergeants:*  
D. McLeod.  
C. B. Williams.  
John Linn.  
*Corporals:*  
W. Lobdell.  
I. J. Jaques.  
J. R. Little.  
Thos. Jester.

COMPANY H.

*Captain:*  
C. W. Gartrell.  
*Lieutenant:*  
H. R. Joslin.  
*First Sergeant:*  
J. V. Guigley.  
*Quartermaster Sergeant:*  
J. B. Collister.  
*Sergeants:*  
O. W. Broberg.  
J. R. Mason.  
L. C. Mosier.  
*Corporals:*  
D. F. Fleming.  
W. T. White.  
D. C. Tate.  
A. G. Van Horn.  
R. N. Walker.  
E. L. T. Shimm.

RECRUIT COMPANY.

*Lieutenant:*  
H. B. Dudley.  
*First Sergeant:*  
P. C. McGilliard.

*Corporals:*  
W. F. Pickett.  
A. J. Hoffman.  
T. R. Knowles.  
C. Schultless.

## College Band

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BAND LEADER,  
BURR HOWEY OZMENT.

Drum Major ..... K. M. MURPHY.  
Principal Musician ..... E. W. FALCONER.

*Sergeants:*

J. T. Riney.  
G. E. Paiton.  
F. H. Robinson.

*Corporals:*

F. W. Albro.  
W. F. Heppe.  
A. W. McCarter.  
R. E. Stewer.  
F. B. Cromer.

*Privates:*

F. Borst.  
A. J. Dyatt.  
P. Falconer.  
L. M. Hanna.  
J. Maninger.  
J. A. Myers.  
G. F. Pallem.  
O. K. Rumbel.  
F. L. Shelly.  
T. G. Spring.  
A. R. Tanner.  
L. R. Varcoe.  
L. O. Wagner.  
G. S. McNamara.

*Sergeants:*

W. F. Smith.  
W. B. Smith.

*Corporals:*

A. M. Butcher.  
O. J. Markham.  
D. A. Robbins.  
F. W. Haines.

*Privates:*

D. L. Cahill.  
C. Elder.  
R. Heppe.  
F. J. Hanna.  
C. Maninger.  
R. H. Oliver.  
W. B. Palmer.  
J. Roeslar.  
J. W. Stockbrand.  
F. Steinkerehen.  
L. R. Vanter.  
L. L. Smith.  
L. G. Geisendorf.



## History of the College

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The Kansas State Agricultural College had its origin in the Bluemont Central College, an institution established at Manhattan under the control of the Methodist Episcopal Church of Kansas. The charter for this sectarian institution, approved February 9, 1858, provided for the establishment of a classical college, but contained the following interesting section:

"The said association shall have power and authority to establish, in addition to the literary departments of arts and sciences, an agricultural department, with separate professors, to test soils, experiment in the raising of crops, the cultivation of trees, etc., upon a farm set apart for the purpose, so as to bring out to the utmost practical results the agricultural advantages of Kansas, especially the capabilities of the high prairie lands."

The corner-stone of the new College was laid on May 10, 1859, and instruction began about a year later. On March 1, 1861, a bill passed the legislature establishing a State university at Manhattan, the Bluemont Central College building to be donated for the purpose. This measure, however, was vetoed by Governor Robinson.

On July 2, 1862, President Lincoln signed the Morrill Act, "An act donating public lands to the several states and territories which may provide colleges for the benefit of agriculture and the mechanic arts." Section 1 of this act provides—

"That there be granted to the several states, for the purposes hereinafter mentioned, an amount of public lands to be appropriated to each state a quantity equal to 30,000 acres for each senator and representative in Congress to which the states are respectively entitled by the apportionment under the census of 1860."

Section 4 requires that the money from the sale of these lands—

"Shall constitute a perpetual fund, the capital of which shall remain forever undiminished, and the interest of which shall be inviolably appropriated by each state which may take and claim the benefit of this act, to the endowment, support and maintenance of at least one college, where the leading object shall be, without excluding other scientific and classical studies, and including military tactics, to teach such branches of learning as are related to agriculture and the mechanic arts, in such manner as the legislatures of the states may respectively prescribe, in order to promote the liberal and practical education of the industrial classes in the several pursuits and professions in life."

Because of the nature of the endowment made by Congress, the institutions founded in accordance with this act are generally known as the "land-grant" colleges. It may well be said that this was the most far-reaching and statesmanlike stroke of educational policy that any government has ever initiated.

On February 3, 1863, Governor Carney signed a joint resolution passed by the Kansas legislature, in accordance with which the provisions of the Morrill Act "are hereby accepted by the State of Kansas; and the State hereby agrees and obligates itself to comply with all the provisions of said act." On February 16 of the same year the governor signed an act which permanently located the College at Manhattan, and provided—

"That the location of the said college is upon this express condition, that the Bluemont Central College Association . . . shall . . . cede to the State of Kansas, in fee simple, the real estate, . . . together with all buildings and appurtenances thereunto belonging; and shall . . . transfer and deliver to said State the apparatus and library belonging to said Bluemont Central College Association."

The three commissioners appointed by the governor selected 82,313.52 acres of the 90,000 granted by Congress. The deficiency of 7686.48 acres—an amount selected and found to lie within a railroad grant—was not made up by Congress till 1907.

After the passage of the creative act, no subsequent legislation was enacted by the federal government with reference to the "land-grant" colleges until the second Morrill Act, for the further endowment of agricultural colleges, was passed. This bill received the signature of President Harrison on August 30, 1890. This act applied—

"A portion of the proceeds of the public lands to the more complete endowment and support of the colleges for the benefit of agriculture and the mechanic arts established under the provision of an act of Congress approved July second, eighteen hundred and sixty-two."

It provided—

"That there shall be and hereby is annually appropriated, out of any money in the treasury not otherwise appropriated, arising from the sales of public lands, to be paid as hereinafter provided, to each state and territory for the more complete endowment and maintenance of colleges for the benefit of agriculture and the mechanic arts now established or which may be hereafter established, in accordance with an act of Congress approved July 2, 1862, the sum of \$15,000 for the year ending June 30, 1890, and an annual increase of the amount of such appropriation thereafter for ten years by an additional sum of \$1000 over the preceding year, and the average amount to be paid thereafter to each state and territory shall be \$25,000, to be applied only to instruction in agriculture, the mechanic arts, the English language, and the various branches of mathematics, physical, natural and economic science, with special reference to the industries of life and to the facilities for such instruction."

The third and last act of Congress increasing the income of agricultural colleges is the Nelson amendment to the agricultural appropriation bill, which was approved March 4, 1907. In addition, however, to providing for an increase in the support of these institutions from federal funds, the law contains the very significant provision specially authorizing the agri-

cultural colleges to use a portion of this federal appropriation for the special preparation of instructors for teaching agriculture and mechanic arts. The essential features of the Nelson amendment are embodied in the following quotation from the bill:

"That there shall be and hereby is annually appropriated out of any money in the treasury not otherwise appropriated, to be paid as hereinafter provided, to each state and territory for the more complete endowment and maintenance of agricultural colleges now established, or which may hereafter be established, in accordance with the act of Congress approved July 2, 1862, and the act of Congress approved August 30, 1890, the sum of \$5000, in addition to the sums named in the said act, for the fiscal year ending June 30, 1908, and an annual increase of the amount of such appropriation thereafter for four years by an additional sum of \$5000 over the preceding year, and the annual sum to be paid thereafter to each state and territory shall be \$50,000, to be applied only for the purposes of the agricultural colleges as defined and limited in the act of Congress approved July 2, 1862, and the act of Congress approved August 30, 1890; provided, that said colleges may use a portion of this money for providing courses for the special preparation of instructors for teaching the elements for agriculture and the mechanic arts."

#### **The Development of the Kansas Agricultural College**

The President and Faculty of the Bluemont Central College became the first board of instruction of the Kansas State Agricultural College, when the former institution was transferred to the State and assumed its present name. The Bluemont Central College was a small institution of the older American classical type, the curriculum resting upon Greek, Latin, and mathematics as the chief fundamentals. Its transfer to the State, and its conversion into the State Agricultural College, involved at the time merely a change in name. The President and Faculty, and the curriculum, remained unchanged. The second catalogue, that of 1864-'65, mentions an "agricultural" course, comprising one preparatory and two collegiate years; but, although this course was strengthened from time to time, the classical studies nevertheless remained until the year 1873, when the character of the institution was radically changed. Intensely practical courses replaced the then existing ones. The new scheme of instruction involved the abolition of the classical course, and the introduction of a practical scheme of industrial education, which comprised a farmer's course of six years, a mechanic's course covering four years, and a woman's course requiring six years. Strong opposition to the new educational policies was encountered, but the authorities of the institution adhered to them unswervingly, until the complete success of the new method silenced criticism. Thus the institution became in fact what it had hitherto been only in name—an agricultural college. In 1879 the Faculty consisted of the President, five professors, and six instructors of lesser rank, with a student body of 207. During this period of development

the College was removed from the original Bluemont College site to its present campus, two miles nearer Manhattan.

From 1879 to 1897 no great changes were made in the courses of study, but the work was systematized and strengthened in many directions, retaining, however, the distinctive stamp of a college related to the industries. In 1897 the student enrollment was 734. The Faculty had grown in numbers, and the activities of the institution along investigative lines had been well begun through the organization of the Agricultural Experiment Station. Beginning with 1897, greater stress was laid upon the study of financial, economic, and social problems. Several men of considerable note were added to the Faculty for the purpose of strengthening these phases of educational work. In 1897 four professional courses, each four years in length, were organized—in agriculture, in mechanical engineering, in domestic science, and in general science. These years, therefore, mark the beginning of an era of broadening and diversification of the lines of instruction.

In 1899 the administration of the institution changed, and during the ten years that followed the institution experienced an era of solid, substantial, and uninterrupted growth, gaining steadily in recognition and in influence over the State.

In 1913-'14, the number of heads of departments and full professors was thirty-seven, while the entire Board of Instruction and employees numbered 260. The student enrollment for the year 1913-'14, but not including the spring term or the Summer School, was 2742. During the fifteen-year period 1899-1914 additional buildings to the value of about \$500,000 were erected on the campus.

The history of the Kansas State Agricultural College may well be divided into five epochs. The first ten years, from 1863 to 1873, may be called the classical period of the College. The succeeding period, from 1873 to 1879, was the formative stage, the years of the foundation of the Agricultural College properly so called, and bore the stamp of a spirit of pure industrialism of the most intensely "practical" type.

The next eighteen years, from 1879 to 1898, may be called the scientific culture period—a period in which, under modified ideals, the institution was sought to be used not so much as a tool to teach young men and women how to make a living as to teach them *how to live*, and strove to accomplish the end of character building by means of scientific and technical training having especial reference to agriculture.

Expansion of courses, with consequent increased flexibility, plasticity, and adaptability of the means of instruction to the various ends of industrial life, marked the following epoch of twelve years. In this period we see a rising tendency toward an increased acknowledgment of the Agricultural College as the guardian and custodian of the State's industrial interests,

and a steady growth of settled confidence over the State in its ability to solve the State's industrial problems.

The present time, therefore, finds the College and its inseparable coadjutor, the Experiment Station, occupying a position of far-reaching power and influence in connection with the most vital interests of the State of Kansas.

The Agricultural College accomplishes the objects of its endowment in several ways. It offers a substantial training in mathematics, in the fundamental sciences, in language, in history and civics, and in such other branches of human knowledge as experience has shown to be best adapted to give mental discipline, to develop good citizenship, and to furnish a proper equipment for entering upon active life. The combination of industrial training with the usual class and laboratory work has a special educational value. By the training of the hands the student is made more efficient in every way, is brought into contact with practical things, and is educated toward, rather than away from, an interest in industry and manual exertion. The general training which the College offers aims, therefore, at an equally efficient development of the physical and the mental powers. The greatest immediate aid to improvement in social well-being and to betterment of the conditions of life is a thorough knowledge of science as applied to daily existence. In chemistry and physics, in geology, in botany, in bacteriology, in entomology, in mechanics, the student is brought to an understanding of the relation of man to the world around him, and to a knowledge of how to utilize natural forces for the protection and improvement of his own life.

The College trains directly toward the productive occupations in a considerable number of specialized branches. For example: In agriculture, the student may specialize in agronomy, horticulture, forestry, animal husbandry, dairying, poultry husbandry, or veterinary science. In engineering, the student may take work in mechanical, electrical, or civil engineering, architecture, or printing. For the young women, training in domestic science, domestic art, home furnishing, home decoration, etc., is offered.

A second large object of the College, made effective through the Agricultural Experiment Station, is to investigate the problems of agriculture in the widest sense. By conducting the researches of the Experiment Station in close connection with the educational work of the College, opportunity is afforded students to gain an understanding and an appreciation of the work of scientific investigation, and to become better able to appreciate the relation of science to agriculture. Opportunity is thus also offered to obtain such training as will fit competent students to become investigators, and to enter fields of agricultural leadership in the experiment stations, in the United States Department of Agriculture, as

heads of private agricultural enterprises, or in the capacity of superintendents and managers of such undertakings.

In addition to the regular educational work, the College now maintains, through the Division of College Extension, a highly organized system of agricultural education among the farmers themselves. A corps of trained and efficient institute lecturers hold meetings in every county in the State, conduct seed trains, dairy trains, corn trains, alfalfa trains, and poultry trains, and publish two series of pamphlets of information and instruction—one for rural teachers, the other for members of farmers' institutes. In addition to the regular staff of the Division of College Extension, many members of the College Board of Instruction, and of the staff of the Experiment Station, give several weeks of each year to the public work of the farmers' institutes.

Finally, the College and the Station together are being increasingly charged by the State government with State industrial and police duties, such as pure food investigations, control of feeding stuffs and fertilizers, State forestry work, and other similar duties.

## **The Experiment Stations**

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### **The Agricultural Experiment Station**

The Kansas Agricultural Experiment Station was organized under the provisions of an act of Congress, approved March 2, 1887, which is commonly known as the "Hatch Act," and is officially designed as—

"An act to establish agricultural experiment stations in connection with the colleges established in the several states under the provisions of an act approved July 2, 1862, and the acts supplementary thereto."

The wide scope and far-reaching purposes of this act are best comprehended by an extract from the body of the measure itself, in which the objects of its enactment are stated as being—

"To aid in acquiring and diffusing among the people of the United States useful and practical information on subjects connected with agriculture, and to promote scientific investigation and experiment respecting the principles and practice of agricultural science."

The law specifies in detail—

"That it shall be the object and duty of said experiment stations to conduct original researches or verify experiments on the physiology of plants and animals; the diseases to which they are severally subject, with remedies for the same; the chemical composition of useful plants at their different stages of growth; the comparative advantages of rotative cropping as pursued under a varying series of crops; the capacity of new plants or trees for acclimation; the analysis of soils and waters; the chemical composition of manures, natural or artificial, with experiments designed to test their comparative effects on crops of different kinds; the adaptation and value of grasses for forage plants; the composition and digestibility of the different kinds of food for domestic animals; the scientific and economic questions involved in the production of butter and cheese; and such other researches or experiments bearing directly on the agricultural industry of the United States as may in each case be deemed advisable."

On the day after the Hatch Act had received the signature of the President, the legislature of Kansas, being then in session, passed a resolution, dated March 3, 1887, accepting the conditions of the measure, and vesting the responsibility for carrying out its provisions in the Board of Regents of the Kansas State Agricultural College.

Until 1908 the expenses of the Experiment Station were provided for entirely by the federal government. The original creative act (the Hatch Act) carried an annual congressional appropriation of \$15,000. No further addition to this amount was made until the passage of the Adams Act, which was approved by the President March 16, 1906. This measure

provided, "for the more complete endowment and maintenance of agricultural experiment stations," a sum beginning with \$5000, and increasing each year by \$2000 over the preceding year for five years, after which time the annual appropriation was to be \$15,000—

"To be applied to paying the necessary expenses of conducting original researches or experiments bearing directly on the agricultural industry of the United States, having due regard to the varying conditions and needs of the respective states or territories."

It is further provided that—

"No portion of said moneys exceeding five per centum of each annual appropriation shall be applied, directly or indirectly, under any pretense whatever, to the purchase, erection, preservation or repair of any building or buildings, or to the purchase or rental of land."

The Adams Act, providing as it does for original investigations, supplied the greatest need of the Experiment Station—the means of providing men and equipment for advanced research. Only such experiments may be entered upon, under the provisions of this act, as have first been passed upon and approved by the Office of Experiment Stations of the United States Department of Agriculture.

In addition to these, there are now in progress, under the Hatch Act and by means of the State fund, a total of over fifty lines of investigation and experiment, covering all phases of agricultural investigation.

The farms, live stock, laboratories, and general equipment of the College are all directly available for the use of the Experiment Station.

In 1913 the legislature of Kansas appropriated the sum of \$25,000 a year for the next biennium, for the further support of the Experiment Station. The income of the Experiment Station for the year 1913-'14 is therefore derived as follows:

Hatch fund (federal).....	\$15,000
Adams fund (federal).....	15,000
State appropriation (general).....	25,000
State appropriation (special):	
Coöperative seed experiments.....	7,500
Irrigation investigations .....	2,000
Total .....	<u>\$64,500</u>

The work of the Experiment Station is published in the form of bulletins, which record the results of investigations along agricultural lines. These bulletins are of three sorts: technical bulletins, which record the results of researches of a purely scientific character, provided for under the Adams Act; farm bulletins which present the data of the technical bulletins in a simplified form, suitable for the general reader; farm bulletins in which a brief, condensed and popular presentation is made of data which call for immediate application, and can not await publication in the regular bulletin series.



In addition to the bulletins, which report original investigations, the Station also publishes a series of circulars for the purpose of conveying needed or useful information, not necessarily new or original. To date the publications of the Station number 197 bulletins and thirty-four circulars.

All bulletins and other publications from the Experiment Station are sent without charge to citizens of the State. Any person in the State who so desires may have his name placed on the permanent mailing list of the Station.

Letters of inquiry and general correspondence should be addressed: "Agricultural Experiment Station, Manhattan, Kan." Special inquiries should be directed, so far as possible, to the heads of departments having in charge the matters concerning which information is desired.

#### PUBLIC WORK OF THE STATION

In addition to the work of agricultural investigation and research, the State has enlarged the activities of the Station along various lines of state executive or control work.

One of the most important of these adjunct offices is that of State Dairy Commissioner, for which an appropriation of \$7500 a year was made for 1914 and 1915. This official, appointed by the Board of Administration, and having his office at the seat of the Agricultural College, is required (Laws of 1909, ch. 237) —

"To inspect or cause to be inspected all the creameries, public dairies, butter, cheese and ice-cream factories, or any place where milk or cream or their products are handled or stored within the State, at least once a year, or oftener if possible."

He may in connection with the Board of Administration of the College—

"Formulate and prescribe such reasonable rules and regulations for the operation of creameries, butter, cheese and ice-cream factories and public dairies as shall be deemed necessary by such board to fully carry out the provisions of this act."

He may act on complaints regarding the sale of unwholesome or unclean dairy products, and may prohibit their sale. He may—

"Condemn for food purposes all unclean or unwholesome milk, cream, butter, cheese or ice-cream, wherever he may find them."

Another important State function is that of the State Entomological Commission. (Laws of 1907, ch. 386; 1909, ch. 27.) This commission, created in 1907, was established—

"To suppress and eradicate San José scale and other dangerous insect pests and plant diseases throughout the State of Kansas."

The professors of entomology at the Agricultural College and at the University of Kansas are by law designated as two of

the five members of the above commission. Acting under the title of State entomologists, they divide between them the territory of the State, for purposes of inspection.

They are empowered—

“To enter upon any public premises . . . or upon any land of any firm, corporation or private individual within the State of Kansas, for the purpose of inspection, destroying, treating or experiment upon the insects or diseases aforesaid.”

They may treat or cause to be treated “any and all suspicious trees, vines, shrubs, plants, and grains,” or, under certain conditions, may destroy them. They must annually inspect all nursery stock, and no nursery stock is to be admitted within the State without such inspection. For the expenses of the work of the commission, \$5000 was appropriated in 1913 for each of the following two years.

Concerned with the live-stock interests of the State is the State Live Stock Registry Board, with regard to which there is the following provision (Laws of 1913):

“Every person, persons, firm, corporation, company or association that shall stand, travel, advertise or offer for public service in any manner any stallion in the State of Kansas, shall secure a license certificate for such stallion from the Kansas State Live Stock Registry Board, as herein provided. Said board shall consist of the dean of the Division of Agriculture, head of the Animal Husbandry Department, and the head of the Veterinary Department of the Kansas State Agricultural College.”

To this board is assigned the duty of licensing stallions used for breeding purposes within the State, and authority to verify their breeding and to classify them under the following heads: pure-bred, grade, cross-bred, and scrub. No animal not thus approved and licensed with the board is permitted to be used for public breeding purposes.

The suppression of tuberculosis in cattle is also delegated by the State to the Agricultural College. (Laws of 1909, ch. 160.)

Another provision for encouraging the improvement of live stock is embodied in an act of the legislature (Laws of 1909, ch. 46)—

“Providing for experimental and demonstration work with live stock at the Kansas State Agricultural College.”

For this purpose there was appropriated the sum of \$7500—

“Which shall be known as a revolving fund, to be used in providing experimental and demonstration work with live stock at the Kansas State Agricultural College, at Manhattan, Kan., under the direction and approval of the Board of Regents of said institution; which said fund shall be used only for the purpose of purchasing live stock and feed, and such other expenses as may be necessary for caring for said live stock and conducting demonstrations and experiments therewith.”

Stock thus acquired can be sold by the Board of Administration, when in the judgment of the Board it seems advisable, and the receipts from such sales are to be turned over to the

State treasurer's office, there to constitute a "revolving fund," to be drawn upon for new purchases of live stock.

By legislative act (Laws of 1909, ch. 49), a "division of forestry" at the Agricultural College is also provided for in the following terms:

"For the promotion of forestry in Kansas there shall be established at the Kansas State Agricultural College, under the direction of the Board of Regents, a division of forestry. The Board of Regents of the Kansas State Agricultural College shall appoint a State forester, who shall have general supervision of all experimental and demonstration work in forestry conducted by the Experiment Station. He shall promote practical forestry in every possible way, compile and disseminate information relative to forestry, and publish the results of such work through bulletins, press notices, and in such other ways as may be most practicable to reach the public, and by lecturing before farmers' institutes, associations, and other organizations interested in forestry."

For carrying into effect the provisions of this act, there was appropriated for the fiscal years 1912 and 1913, \$2000 each.

The State has also placed the Experiment Station in charge of the execution of the acts concerning the manufacture and sale of live-stock remedies and commercial feeding-stuffs (Laws of 1913), and also of commercial fertilizers (Laws of 1907, chapter 217). It is provided by the statutes that—

"Every brand of live-stock remedy and every brand of commercial feeding-stuff offered or held for sale or sold within the State of Kansas shall be registered in the office of the Director of the Agricultural Experiment Station of the Kansas State Agricultural College, and each sale of any such brand not so registered shall constitute a separate violation of this act."

And—

"Except as herein provided, it shall be unlawful within the State of Kansas to sell, offer for sale, or expose for sale any commercial fertilizer which has not been officially registered by the Director of the Agricultural Experiment Station of the Kansas State Agricultural College."

These general provisions are limited in their application by important exceptions stated in the laws. The fees collected under these acts are used to defray the necessary expenses incurred in carrying out the provisions of the act.

It will thus be seen that the State of Kansas is making increasing use of the scientific staff of the Experiment Station in matters of State importance requiring the application of technical knowledge.

A late and important addition to the Experiment Station is the recently established Department of Milling Industry. The great economic importance of the wheat and milling interests of this State, and the difficult nature of the problems connected with the milling and baking quality of wheat, render it imperative that scientific research be conducted on the subject. The hearty coöperation and financial support of all the millers' associations and of other commercial bodies rendered it finan-

cially possible to inaugurate this important experimental work until special legislative appropriation could be secured. The legislature of 1913 appropriated \$7500 for mill equipment, and there is now installed the best equipped experimental milling plant in the United States.

The research work includes a complete study of the growing, harvesting, storing and marketing practices and their relation to the milling value of wheat; of systems of grading, and their effect upon the market value of grain; of insect enemies of wheat in the field and in storage; and of flour and mill by-products. There will also be conducted a comprehensive study of the effects of climate and soil upon the chemical composition of wheat, and upon its subsequent milling and baking quality. A specially equipped laboratory for carrying on experimental baking tests, and for making certain chemical determinations, has been installed. This will aid very materially in carrying on the research work.

By the act of the legislature (Laws of 1911, ch. 23, p. 46) the Board of Administration is authorized—

“To investigate the present methods used in growing and distributing agricultural seeds in the State; to determine by experiments the methods of growing seed best adapted to different localities; to encourage farmers in the use of the best methods of seed production; to determine by investigation those localities most in need of improved seed, and to aid such localities in securing desirable seed.”

For carrying out the provisions of this act, the sum of \$7500 is appropriated for each of the two years 1914 and 1915.

Experiments and demonstrations on the proper use of irrigation waters, in coöperation with the irrigation investigations of the United States Department of Agriculture, are authorized by act of the legislature (Laws of 1911, ch. 214, p. 378). For this purpose there was appropriated the sum of \$2000 annually for the years 1913-'14 and 1914-'15.

The government supplies an equal amount of money each year, making a total of \$4000 a year for coöperative irrigation investigations.

### **Branch Agricultural Experiment Stations**

#### **FORT HAYS BRANCH STATION**

The land occupied by this Station is a part of what was originally the Fort Hays military reservation. Being no longer required for military purposes, it was turned over to the Department of the Interior October 22, 1899, for disposal under the act of Congress of July 5, 1884. Before final disposition of this land was made, however, the Kansas legislature, in February, 1895, passed a resolution requesting the Congress of the United States to donate the entire reservation of 7200 acres to the State of Kansas for the purposes of agricultural education and research, for the training of teachers, and for the

establishment of a public park. Bills giving effect to this request were introduced into Congress without avail, until the fifty-sixth Congress, when, through the influence of Senator, later Regent, W. A. Harris, and of Congressman Reeder, a bill was passed, setting aside this reservation "for the purposes of establishing an experimental station of the Kansas Agricultural College and a western branch of the Kansas State Normal School thereon and a public park." This bill was approved by the President on March 28, 1900. By act of the State legislature, approved on February 7, 1901, the act of Congress donating this land and imposing the burden of the support of these institutions was accepted. The same session of the legislature passed an act providing for the organization of a branch experiment station and appropriating a small fund for preliminary work.

The land at the Fort Hays Branch Station consists mainly of high rolling prairie, with a limited area of rich alluvium bordering on a creek, and is situated on the edge of the semi-arid plains region. It is well suited for experimental and demonstration work in dry farming, in irrigation, and in crop, forestry, and orchard tests, under conditions of limited rainfall and high evaporation.

The work of this Station is confined to the study of the problems peculiar to the western half of the State, and relates especially to crop production under limited rainfall, to the origination of varieties better adapted to the climatic conditions there prevailing, and to studies of the systems of animal husbandry suited to this region. A systematic study of the value of trees as preventives of soil drifting is being made on a scale sufficiently large to bring definite conclusions. The facilities of this Station are being used for the growing of large quantities of pure seed of the strains and varieties which have proved in actual test to be most productive in the western part of the State.

This Station is supported entirely by State funds and by the sale of farm products. Under the terms of the acts of Congress establishing and supporting agricultural experiment stations, and under the rulings of the United States Department of Agriculture, none of the funds appropriated by the federal government may be used for the support of branch experiment stations.

The State appropriation for the maintenance of the Fort Hays Branch Experiment Station is \$25,000 for 1914 and \$25,000 for 1915.

#### GARDEN CITY BRANCH STATION

In 1906 the county commissioners of Finney county purchased, for purposes of agricultural experimentation, a tract of land amounting to 320 acres, situated four and one-half miles from Garden City, on the unirrigated upland.

This land has been leased for a term of ninety-nine years to the Kansas Agricultural Experiment Station as an "experimental and demonstration farm," for the purpose of determining the methods of culture, crop varieties, and crop rotations best suited to the southwestern portion of the State, under dry-land farming conditions. A pumping plant irrigating from eighty to one hundred acres has been installed for the purpose of investigating the expense of pumping and the cost of equipment necessary for plants of this type which are common in the shallow-water district between Garden City and Scott City and along the Arkansas valley. The "duty of water" and the methods of applying water are objects of investigation. For improvements and maintenance of this Station the sum of \$5000 a year was appropriated for 1914 and 1915.

#### OTHER BRANCH STATIONS

Branch stations are maintained at Dodge City and Tribune. At these stations experimental and demonstration work is conducted for the benefit of the districts surrounding these points. Cropping systems, summer-fallow methods, time of planting, variety testing, and breeding of special crops are the principal work undertaken. At Dodge City a dairy herd is maintained.

The legislature of 1913 appropriated for the maintenance of the Dodge City Station \$2500 for the year 1914, and \$2500 for the year 1915, and for the Tribune Station \$2500 for 1914, and \$2500 for 1915. The legislature of 1913 also appropriated \$6000 for the establishment of a Branch Station in Kearny county, with \$2000 maintenance for 1913-'14, and \$2000 for 1914-'15. It also appropriated \$11,000 for the establishment of a Branch Station in Thomas county, with \$2000 additional for maintenance for 1913-'14, and \$2000 for 1914-'15.

#### **The Engineering Experiment Station**

The Engineering Experiment Station was established for the purpose of carrying on continued series of tests of engineering and manufacturing value to the State of Kansas, on a scale sufficiently large for the results to be of direct commercial value.

Tests of cement and concrete are being conducted, using principally Kansas-made cements and such materials for the aggregate in the concrete as can be found in different localities in the State. In connection with this series of tests, a study is being made of the waterproofing and coloring of cement building blocks.

Tests of Kansas coals are being made. These include mine-run, slack, nut, screened, lump, and washed-pea coals. The purpose is not only to determine the relative values of the dif-

ferent coals for steam generation, but more particularly to ascertain the best methods of firing the coals of each locality, and the relative values of the different kinds of coal obtained from any single mine. These tests are conducted with both natural and induced draft, the Station owning an induced-draft equipment and economizer.

The Station owns a 100-horsepower and a 150-horsepower gas producer using bituminous coal. Tests that have been carried on have been for the purpose of determining the relative values of the various coals as regards (1) cost per cubic foot of gas; (2) adaptability with respect to mechanical manipulation in the producer; (3) freedom from sulphur and disagreeable gases; (4) the production of tar and other by-products; special research.

The producer testing equipment includes calorimeters for the analysis of solid, liquid and gaseous fuels, a Venturi tube for the measurement of gas, a thermoelectric pyrometer, and such other apparatus as is essential for the carrying out of complete tests. Each test is conducted for a period of several weeks, in order to eliminate errors in the estimation of the coal and "stand-by" losses.

As there are but very few other plants in the country satisfactorily using bituminous coal for producer gas, it is believed that the experiments now being carried on will give valuable results.

Other experiments now in progress are concerned with (1) lubricants and bearings; (2) power required for driving machine tools; (3) loss of power in transmission by shaft, bearings, chains, and gears; (4) the relative adaptability, efficiency and cost of gasoline, kerosene and denatured alcohol for internal-combustion engines; (5) the cost of compressing air and the efficiency of compressed air for power purposes; (6) endurance of paints. As applied to roofs, the paint tests have been in progress for five years, and they will be extended to include other cases of exposure to weather. The investigation is directed especially to the relation of the chemical nature of the pigments and of the oils employed in painting to the durability of the paints. (7) Tests on pipe-covering; (8) tests on heavy-oil engines.

Among the projected investigations are (1) underground water-flow in various parts of the State, and methods of developing it for irrigation; (2) the possibilities of developing waterpower for small plants to be used on farms and in isolated communities for driving machinery, either directly or by electric transmission, and for lighting; this investigation to include the preparation and publication of plans for these plants; (3) the continuation of investigations as to the strength of structural details in timber, metal, and reinforced

concrete; (4) studies of the tractive effect or efficiency of draught horses; (5) tests of small gasoline-electric units; (6) methods of cooling condensed steam; (7) tests of Kansas brick and other road material.



## **Grounds, Buildings, and Equipment**

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The college campus occupies a commanding and attractive site upon an elevation adjoining the western limits of the city of Manhattan, with electric car service into town and to the railway stations. The grounds are tastefully laid out according to the designs of a landscape architect, and are extensively planted with a great variety of beautiful and interesting trees, arranged in picturesque groups, masses, and border plantings, varied by banks of shrubbery and interspersed with extensive lawns, gardens, and experimental fields. Broad, well-shaded macadamized avenues lead to all parts of the grounds. Cement walks connect all of the buildings with one another and with the entrances. Including the campus of 160 acres, the College owns 748 acres of land at Manhattan, valued at \$185,000, and rents 522 acres in addition. Outside the campus proper, all of the land is devoted to educational and experimental work in agriculture. Within the college grounds, most of the space not occupied by buildings and needed for drives and ornamental planting is devoted to orchards, forest and fruit nurseries, vineyards, and gardens. A number of fields in the northern and western portions of the campus are used for general experimental work by various departments.

The college buildings, twenty-one in number, are harmoniously grouped, and are uniformly constructed of limestone obtained from the college quarries. A central power plant furnishes steam heat and electric light and power to the buildings, and a plant for the manufacture of producer gas supplies some of the laboratories and shops. The College owns and operates its own system of waterworks and is provided with a complete sewerage system.

**AGRICULTURAL HALL (NEW).** Cost of portions now completed, \$125,000; cost of building when developed and completed as planned, \$500,000. The completed building will consist of a central portion (130 x 80 feet), with basement and three stories; of two wings (each 80 x 169 feet), with basement and three stories, and with a sub-basement under half of the east wing; and of a stock-judging pavilion placed back of the central portion and between the wings. This pavilion is now completed, and contains tie and box stalls and two large stock-judging rooms (45 x 100 feet), each having a seating capacity of 475. Each of these rooms may be divided into two, with a passage between, by the use of curtains. The east wing of the building is used by the Departments of Agronomy, Animal Husbandry, Milling Industry, and Poultry Husbandry.

This wing contains, besides offices and recitation rooms of these departments and the general offices of the Agricultural Experiment Station, a complete small flour mill, and laboratories for grain judging. Value of equipment and apparatus: Agronomy, \$6460; Animal Husbandry, \$2339; Executive Department, \$1800; Experiment Station, \$2958; Milling Industry, \$10,350; Poultry Husbandry, \$2219. Erected, 1912.

AGRICULTURAL HALL (OLD). Erected, 1900; cost, \$25,000; dimensions, 90 x 95 feet; two stories and basement. Occupies the original site of the president's house, destroyed by lightning in 1896. Contains classrooms and offices of the School of Agriculture. Value of equipment, \$515.

ANDERSON HALL. Erected, 1879; cost, \$79,000; dimensions, 152 x 250 feet; two stories and basement. Contains the offices of administration of the College, a lecture hall, the college post office, offices of the Division of College Extension, and offices and classrooms of the Departments of Architecture and Drawing, Economics, English Language, English Literature, and Mathematics. Value of equipment and apparatus, \$11,777.

AUDITORIUM. Erected, 1904; cost, \$40,000; dimensions, 113 x 125 feet. Seating capacity, 2300. Contains also the offices and music rooms of the Department of Music. Value of equipment: Executive Department, \$176; Music, \$2824.

CHEMISTRY ANNEX. Erected, 1876; cost, \$8000; dimensions, 35 x 110 and 46 x 175 feet, in the form of a cross. Originally erected as a chemical laboratory; occupied by the Department of Chemistry until 1900, when a fire destroyed the interior. The building was reconstructed in 1902, at a cost of \$5000, for use as a women's gymnasium. Since the fall of 1911 the building has been used by the Department of Chemistry. Value of apparatus and equipment, about \$4000.

DAIRY BARN. Erected, 1900; cost, \$4000; dimensions, 40 x 175 feet. Fitted with modern swinging stalls for eighty head of cows, and arranged in two rows with driveway between. Value of equipment: Dairy Husbandry, \$1400.

DAIRY HALL. Erected, 1904; cost, \$15,000; dimensions, 72 x 103 feet; one story and basement. Contains butter-manufacturing rooms, hand-separator room, laboratory, class room, three offices, and two refrigerating rooms. Occupied entirely by the Department of Dairy Husbandry. Value of equipment and apparatus, \$7800.

DENISON HALL. Erected, 1902; cost, \$70,000; dimensions, 96 x 166 feet; two stories and basement. The east wing is occupied throughout by the laboratories, class rooms, and offices of the Department of Chemistry. The west wing is occupied by the Department of Electrical Engineering and by the Department of Physics. Value of equipment and apparatus: Chemistry, \$29,436; Electrical Engineering, \$17,271; Executive, \$990; Physics, \$8979.

DOMESTIC SCIENCE AND ART HALL. Erected, 1908; cost, \$70,000; dimensions, 92 x 175 feet; two stories and basement. The first floor and basement are occupied by the laboratories, class rooms, and offices of the Department of Domestic Science; the second floor is occupied by the laboratories, class rooms, and offices of the Department of Domestic Art. Value of equipment and apparatus: Domestic Science, \$11,966; Domestic Art, \$4011; Executive, \$526.

ENGINEERING SHOPS. These consist of several connected structures, erected at different times. The original building, now used as the woodworking shop, was erected in 1876; a series of additions having later been successively made, the present group is the result. The cost of the whole amounts to \$35,000. A portion of the building is two stories high. On the upper floor, which has a floor area of 9260 square feet, are class rooms, drafting rooms, pattern storage room and offices of the Departments of Steam and Gas Engineering, Applied Mechanics and Machine Design, and Shop Practice. The woodworking shop (35 x 219 feet) is equipped with the necessary bench tools and woodworking machinery. Adjoining is the machine shop (40 x 170 feet), supplied with benches and tools and amply equipped with the necessary machine tools. The blacksmith shop (50 x 100 feet) contains 35 forges of modern type, connected with power blast and down-draft exhaust. Adjoining is the lecture hall, with demonstration forge and equipment. The iron foundry (27 x 100 feet) and brass foundry (24 x 34 feet) are well supplied with the necessary equipments. The wash and locker room (36 x 40 feet) contains 250 steel lockers. A general supply room (22 x 24 feet) is conveniently located for storing the necessary small supplies. Value of equipment and apparatus, \$38,012.

FAIRCHILD HALL. Erected, 1894; cost, \$67,750; dimensions, 100 x 140 feet; two stories, basement, and attic. On the first floor are the college library and reading rooms, a newspaper reading room, offices of the librarian and his assistants, and the general museum. On the second floor are the offices, class rooms and laboratories of the Departments of Zoölogy, Entomology, and Geology, and of History and Civics. The museums of natural history are placed here also. The basement is occupied largely by recitation rooms and offices of the Department of History and Civics and the Department of Public Speaking. Value of equipment and apparatus: Entomology, Geology, and Zoölogy, \$26,575; Executive, \$1209; History and Civics, \$515; Library, \$123,110.

FARM BARN. Erected, 1913; cost, \$17,000; a stone structure, dimensions, 80 x 160 feet. The west wing contains nine box stalls and twenty-six single stalls, equipped with sanitary feed mangers and racks and designed especially for the housing of horses. The east wing contains twelve box stalls and thirty

single stalls for the breeding cattle and show herd. Center section, office and carriage rooms, with basement for heating apparatus. Value of equipment: Department of Animal Husbandry, \$1000.

**FARM MECHANICS HALL.** Erected, 1870; cost, \$11,250; dimensions, 46 x 95 feet; two stories. The first building erected on the present campus. Originally designed as a college barn, and first used for that purpose. Later used as a general college building, then by the Department of Botany, and afterwards by the Department of Veterinary Medicine. The first floor, a large hall, was used by the Department of Military Science for many years, as an armory. The entire building has been given over for the use of the Department of Farm Mechanics, and is filled with all types of farm machinery. Value of equipment, \$7000.

**HORTICULTURAL BARN.** Erected, 1880; cost, \$1000. Contains storeroom, granary, and stable room for several horses.

**HORTICULTURAL HALL.** Erected, 1907; cost, \$50,000; dimensions, 72 x 116 feet. This building, one of the best and most commodious on the campus, is now used by the Departments of Botany, Horticulture, and Forestry. Its class rooms, laboratories, museums, and equipment are modern and ample. Value of equipment: Botany, \$25,372; Executive, \$609; Forestry, \$435; Horticulture, \$4929.

**HORTICULTURAL HALL (OLD).** Erected, 1877; cost, \$4000; dimensions, 32 x 80 feet; one story and basement.

**HORTICULTURAL LABORATORY.** Erected, 1888; cost, \$5000; dimensions, 30 x 30 feet; one story and basement. Used for many years by the Department of Horticulture and Entomology, then for horticultural work when that was made a separate department. Contains offices occupied by the State Dairy Commissioner. Five propagating houses are connected with it. Value of equipment, \$987.

**KEDZIE HALL.** Erected, 1897; cost, \$16,000; dimensions, 70 x 84 feet; two stories and basement. The first floor and basement are occupied by the Department of Printing and by offices of the Department of the English Language; the second floor is divided into general class rooms and offices used by the Departments of Industrial Journalism and the English Language. Originally constructed for the use of the Departments of Domestic Science and Domestic Art, the building has been used for present purposes since 1908. Value of equipment and apparatus: English Language, \$455; Executive, \$380; Industrial Journalism, \$563; Printing, \$7187.

**MECHANICAL ENGINEERING HALL.** Erected, 1909; cost, \$80,000; dimensions, 113 x 200 feet; three stories in height, but much of it built on the gallery plan rather than by complete floor separation into different stories. This building contains the general offices of the Division of Engineering, the

offices and drafting rooms of the Departments of Civil Engineering and Architecture, an engineering reference library and reading room, an amphitheater for lectures and demonstrations, and the experimental laboratories for applied mechanics, hydraulics, thermodynamics, transmission, and gas and oil engines. The engines, turbines, generators and boilers that furnish power and light for the College are installed in this building. Value of equipment and apparatus, \$77,087.

NICHOLS GYMNASIUM. Erected, 1911; cost, \$122,000; dimensions, 102 x 221 feet; three stories and basement. The building consists of a main section and two wings. The main section (85 x 141 feet), consisting of two stories and a basement, is used as a men's gymnasium and armory, and contains a running track, sixteen laps to the mile. The east half of the basement of the main section contains a swimming pool, baths, rest room, etc., for women; the west half contains a swimming pool and baths for men. The east wing (49 x 102 feet) contains the women's gymnasium, class rooms and offices of the Department of Military Training and several literary society halls. The west wing (40 x 102 feet) contains the offices of the Director of Physical Training, a large locker room for men, class rooms, and offices of the Department of German, and several literary society halls. This building, which is modern in every respect, is constructed on the old armory-castle type and is a magnificent piece of architecture. Value of apparatus and equipment, \$4939.

VETERINARY HALL. Erected, 1908; cost, \$70,000; dimensions, 133 x 155 feet; two stories and basement. Occupied by the laboratories, demonstration and dissecting rooms, class rooms and offices of the Departments of Veterinary Medicine and Bacteriology. Value of equipment and apparatus: Veterinary Medicine, \$14,838; Bacteriology, \$6524; Executive, \$404.

In addition to the substantial stone buildings mentioned above the College has a number of other buildings, among others the following:

SERUM BARN. Erected, 1914; cost, \$3000; dimensions, 92 x 96 feet; contains thirty pens, each 8 x 12 feet, and two feed rooms of the same dimensions. This is a frame and cement building situated three-quarters of a mile north of the College campus.

SERUM BUILDING. Erected, 1914; cost, \$7000; constructed of brick; dimensions, 24 x 60 feet; two stories.

## Library

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The general College Library consists of all books belonging to the College, including the library of the Experiment Station, which is incorporated with it. On January 1, 1914, the Library contained 44,236 bound volumes, besides much unbound material. It receives currently about four hundred serial publications. As a depository the Library receives the documents and other publications of the United States government. The books are classified according to the Dewey system and are indexed in a dictionary card catalogue.

All students, as well as all officers of administration and instruction, have the privilege of direct access to the book stacks. The Library is primarily for free reference use, but the privilege of drawing books is accorded to all those connected with the College as registered students or as members of the Faculty. Books not specially reserved may be drawn for home use for two weeks. All books are subject to recall at any time.

General reference books, books reserved for classes, general periodicals, and certain other groups of books are to be consulted only in the reading rooms. They may not be loaned from the Library except when the reading rooms are closed. They must then be returned to the Library by the time it next reopens. Any violation of the regulations of the Library subjects the offender to a fine, or to a withdrawal of Library privileges, or to both, according to the gravity of the offense. More serious offenses, such as mutilation or theft of books or periodicals, are considered just causes for suspension or expulsion of the offender, who is also required to make good the loss incurred.

*Reading Rooms.*—Three reading rooms are maintained in connection with the Library: the general reference room, containing encyclopedias, dictionaries, atlases, bibliographies, and general reference books; the special reference room, containing books reserved for classes; and the periodical room, containing current magazines and the important daily and weekly Kansas newspapers. These rooms are freely open to the students and to the public for purposes of reading and study.

*Divisional Libraries.*—Divisional and departmental collections are deposited in certain College buildings apart from the main Library. These collections are for the special convenience of the instructors and students of the departments concerned. They are under the direction of the Librarian and are accessible to all students at regular hours.

*Hours of Opening.*—The Library is open daily, except on legal holidays, from 7:30 o'clock A. M. to 5:30 o'clock P. M. during the regular College year. During vacation periods it is open daily from 8 o'clock A. M. to 5 o'clock P. M.

## Requirements for Admission

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The entrance requirements to the College are made broad and flexible, only fundamental subjects being definitely required. These requirements are made upon the supposition that high schools are local institutions in which the courses should be adapted to the needs of the individual localities, and that college entrance requirements should be such as to take the output of the high schools, rather than to determine the nature of the work offered in them.

Persons, to be admitted to any department of the College, must be at least fourteen years of age. Fifteen units of high-school work are required for admission to the freshman class. A unit is defined to be the work done in an accredited high school or academy in five recitation periods a week for one school year. All persons who offer fifteen units of work done in an accredited high school, and accepted by such high school for graduation, will be admitted to the freshman class. One who offers fourteen such units will also be admitted as a freshman, but will be conditioned in one unit. Such deficiency must be made up the first year that the student is in attendance. If not made up within that time college credits are taken in its place.

For courses in the divisions of agriculture, home economics or general science the high-school work offered must include three units of English, two units of mathematics, and one unit of physics. For courses in the division of mechanic arts the high-school work offered must include, in addition to the preceding, another unit of mathematics. Students lacking any of these must make them up before graduation, and before being assigned to dependent subjects.

It is recommended that all high-school students planning to enter the College include a year of botany in their high-school course.

### ENTRANCE SUBJECTS

The subjects from which entrance credit may be offered, together with the number of units, are arranged in eight groups, as follows:

GROUP I	
English	Three or four units
GROUP II	
Latin, one, two, three, or four units	
Greek, one, two, three, or four units	
Foreign	German, one, two, three, or four units
Languages	French, one, two, three, or four units
	Spanish, one, two, three, or four units

GROUP III Mathematics	Elementary algebra, one or one and one-half units			
	Plane geometry, one unit			
	Solid geometry, one-half unit			
	Plane trigonometry, one-half unit			
	Advanced algebra, one-half unit			
GROUP IV Natural Sciences	Physical geography, one-half or one unit			
	Physics, one unit			
	Chemistry, one unit			
	Botany, one-half or one unit			
	Zoölogy, one-half or one unit			
	Physiology, one-half or one unit			
GROUP V History and Social Sciences	General Biology, one-half or one unit			
	Greek and Roman History, one unit			
	Medieval and Modern History, one unit			
	English History, one unit			
	American History, one unit			
	Economics, one-half or one unit			
	Sociology, one-half unit			
GROUP VI Normal Train- ing Subjects	Civics, one-half unit			
	Psychology, one-half unit			
	Methods and Management, one-half unit			
	Higher Arithmetic, one-half unit			
	Reviews—			
	<table> <tr> <td>Grammar, twelve weeks</td><td rowspan="3">} one unit</td></tr> <tr> <td>Geography, twelve weeks</td></tr> <tr> <td>Reading, twelve weeks</td></tr> </table>	Grammar, twelve weeks	} one unit	Geography, twelve weeks
Grammar, twelve weeks	} one unit			
Geography, twelve weeks				
Reading, twelve weeks				
GROUP VII Industrial Subjects	Music, one unit			
	Agriculture, one-half or one, two, three, or four units			
	Drawing, one-half or one unit			
	Woodwork, one-half, one or two units			
	Forging, one-half or one unit			
	Domestic Science, one-half, one or two units			
GROUP VIII Commercial Subjects	Domestic Art, one-half, one or two units			
	Commercial Law, one-half unit			
	Commercial Geography, one-half unit			
	Bookkeeping, one-half or one unit			
	Stenography and Typewriting, one-half or one unit			

## DEFICIENCIES

The courses in the School of Agriculture offered in connection with the College give every needed opportunity for students of the College to make up anything lacking in their preparation for entrance. All such entrance deficiencies must be made up before the beginning of the sophomore year. No student is registered in the senior class unless all deficiencies of the preceding years have been provided for. Candidates for graduation must make up all deficient subjects before the beginning of the spring term of the senior year. No student is considered a candidate for graduation the next June who is deficient more than three full subjects in addition to his regular assignment at the beginning of the fall term. No student who fails or is conditioned or found deficient in any subject, or



whose grade in more than one subject falls below G in any term, is allowed to carry extra work during the succeeding term.

#### ADVANCED CREDIT

At the discretion of the President, students who present certificates showing credits for college work done in other institutions are allowed hour-for-hour credit on courses in this College in so far as they may be directly applied, or can be accepted as substitutions or electives. In cases in which it is impossible for one to furnish an acceptable certificate concerning work upon which advanced credit is asked, examinations are given, if the subject has been studied under competent instruction.

#### ADMISSION

**ADMISSION BY EXAMINATION.** Examinations for admission will be held at the College on Tuesday, September 15, 1914; Monday, January 4, 1915, for the winter term; and Monday, March 29, 1915, for the spring term.

**ADMISSION BY CERTIFICATE.** The applicant is required to submit to the committee on admission a certificate of the high-school or academy credit properly certified to by the authorities of the institution in which the work was done. Blanks will be furnished by the College for this purpose. It is requested that all work done in such high school or academy be presented upon these blanks, in order to expedite the granting of credit to such applicants as are entitled to it.

It is greatly to the advantage of the prospective student to see to it that this blank, properly filled out, be sent to the College as soon as possible after graduation. A permit to register will then be sent him by the Registrar in advance of his coming in September. This will greatly facilitate the work of entrance. The student will present this permit at the registration room in Nichols Gymnasium, and will not be compelled to wait his turn to meet the committee on admission.

#### SPECIAL STUDENTS

In recognition of the fact that experience and maturity tend to compensate, in a measure at least, for lack of scholastic attainments, the College admits as special students those who are twenty-one years of age or older, without requiring them to pass the regular examinations, provided (1) they show good reason for not taking a regular course; (2) they be assigned only to such work as they are qualified to carry successfully; (3) they do superior work in the subjects assigned.

A special student is assigned by the dean of the division in which occur the major subjects to be pursued.

# HIGH SCHOOLS IN ACCREDITED RELATIONS WITH THE COLLEGE

(Graduates admitted without examination)

Abilene	Clyde	Hesston Academy
Admire	Coffeyville	Hiawatha
Agra	Coldwater	Hill City
Alma	Colony	Highland
Alden	Concordia	Hillsboro
Almaena	Conway Springs	Holsington
Alta Vista	Corning	Holton
Alton	Council Grove	Horton
Altoona	Crawford County	Howard
Anthony	(Cherokee)	Humboldt
Americus	Cunningham	Iola
Argentine	Decatur County	Irving
Arkansas City	(Oberlin)	Jetmore
Ashland	Dickinson County	Jewell City
Atlanta	(Chapman)	Junction City
Attica	Delphos	Kansas City
Atchison	Derby	Kensington
Atchison County	Dexter	Kingman
(Effingham)	Dixon Township	Kinsley
Augusta	(Argonia)	Kincaid
Axtell	Dodge City	Kiowa County
Baker Academy	Douglas	(Greensburg)
(Baldwin)	Easton	Kiowa
Baldwin	El Dorado	Kirwin
Basehor	Edwardsville	Labette County
Barnard	Fillinwood	(Altamont)
Baxter Springs	Ellis	La Crosse
Beattie	Ellsworth	La Cygne
Belle Plaine	Elsmore	La Harpe
Belleville	Elwood	Lakin
Beloit	Emporia	Lane County
Belpre	Englewood	(Dighton)
Benedict	Enterprise	Lansing
Beverly	Erie	Larned
Blue Mound	Esbon	Latham
Blue Rapids	Esdrige	Lebanon
Bonner Springs	Eudora	Leon
Bronson	Eureka	LeRoy
Brookville	Everest	Lawrence
Bucklin	Fairview	Leavenworth
Buffalo	Florence	Lewis
Bunker Hill	Formoso	Liberal
Burden	Fort Scott	Lincoln
Burlingame	Fowler	Lindsborg
Barlington	Frankfort	Linwood
Barns	Fredonia	Little River
Burr Oak	Frontenac	Logan
Burrton	Galena	Longton
Caldwell	Garden Plain	Lost Springs
Caney	Garden City	Lucas
Canton	Garnett	Lyndon
Carbondale	Gas City	Lyons
Catholic High School	Girard	Macksville
(Kansas City, Kan.)	Glasco	Madison
Cawker City	Glen Elder	Maize
Centralia	Goddard	Maple Hill
Chase	Goff	Manhattan
Chase County	Grant County	Mankato
(Cottonwood Falls)	(New Ulysses)	Marion
Chanute	Great Bend	Marysville
Cheney	Greeley County	Marquette
Cherokee County	(Tribune)	Minneapolis
(Columbus)	Greenleaf	Montgomery County
Cherryvale	Grenola	(Independence)
Chetopa	Gypsum	McLouth
Cheyenne County	Halstead	Meade
(St. Francis)	Hanover	Medicine Lodge
Cimarron	Harper	Melvorn
Circleville	Hartford	Meriden
Claffin	Harveyville	Mildred
Clay County	Havensville	Moline
(Clay Center)	Hays	Moran
Clearwater	Hazelton	Morrill
Clifton	Herington	Mound City

Moundridge	Reading	Summerfield
Mount Hope	Redfield	Sylvan Grove
Mulvane	Republic	Syracuse
Muscotah	Richmond	Tescott
Natoma	Rose Hill	Thayer
Nazareth Academy	Rosedale	Thomas County
(Concordia)	Rossville	(Colby)
Neodesha	Reno County	Tonganoxie
Neosho Falls	(Nickerson)	Topeka
Neosho Rapids	Russell	Toronto
Ness City	Russell Springs	Towanda
Newton	Sabetha	Trego County
Bethel Academy	Salina	(Wa Keeney)
(Newton)	Sacred Heart Academy	Troy
Norton County	(Salina)	Udall
(Norton)	St. John	Valley Center
Nortonville	Savonburg	Valley Falls
Norwich	Scandia	Vermillion
Oakley	Scott County	Viola
Olathe	(Scott)	Wakefield
Onaga	Scranton	Waldo
Oneida	Seneca	Walnut
Osage City	Sedan	Walton
Osawatomie	Sedgwick	Wamego
Osborne	Severance	Waterville
Oskaloosa	Sharon	Washburn Academy
Oswego	Sharon Springs	(Topeka)
Ottawa	Sheridan County	Washington
Ottawa University Academy	(Hoxie)	Wathena
(Ottawa)	Sherman County	Waverly
Overbrook	(Goodland)	Wellsville
Oxford	Smith Center	Wetmore
Paola	Soldier	Westmoreland
Parsons	Solomon	White City
Paxico	Southwestern Academy	White Water
Partridge	(Winfield)	Whiting
Pawnee Rock	Spring Township	Wichita
Peabody	Stark	Winfield
Perry	Spearville	Wichita County
Phillipsburg	Spivey	(Leoti)
Pittsburg	Stafford	Williamsburg
Plainville	Sterling	Wilson
Pleasanton	St. Marys	Wilson High School
Pemona	St. Mary's Academy	(Kansas City, Kan.)
Portis	(Leavenworth)	Winchester
Potwin	Stockton	Windom
Pratt	Sumner High School	Woodston
Preston	(Kansas City, Kan.)	Yates Center
Protection	Sumner County	
Queenemo	(Wellington)	

## Requirements for Graduation

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For graduation, one must complete one of the four-year courses as shown elsewhere. These are believed to provide for the necessities of most students who seek an institution of this kind, and departures from the specified work are not encouraged. Under special conditions, however, such College substitutions are allowed as the interests of the student demand. The total requirement, including military drill or physical training, is about 220 term hours, or credits, the credit unit being one hour of recitation or lecture work, or two hours of laboratory work, a week, for one term of twelve weeks. As the allowance for laboratory work is liberal, and much of this is included in all courses, the total requirement named is not regarded as excessive.

### DEGREES

The degree of bachelor of science (B. S.) is conferred upon those completing the four-year course in agriculture, mechanical engineering, electrical engineering, civil engineering, architecture, industrial journalism, home economics, or general science.

The degree of doctor of veterinary medicine (D. V. M.) is conferred upon those completing the four-year course in veterinary medicine.

The degree of bachelor of agriculture is conferred upon students who have completed the freshman and sophomore work of the four-year course in agriculture, who have been conspicuously successful in farming for a period of five years under the supervision of the Faculty of the College, and who have furnished the Faculty, through the Dean of the Division of Agriculture, acceptable reports of their work and progress.

### CERTIFICATES

A certificate in agriculture is granted students completing the first two years of the four-year course in agriculture.\*

A certificate is granted to those completing either of the two-year short courses in agriculture.

A certificate is granted to those completing the six-month housekeeper's course.

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\* Under certain conditions and restrictions, students of mature years who can not spend four years in college, and who may be applicants for the degree of bachelor of agriculture or for the certificate in agriculture, may, on the completion of all of the work required in the freshman year, have the privilege of selecting such courses in advance of the sophomore year, under the advice and with the approval of the Dean of the Division of Agriculture, as may be especially adapted to their needs; but in no case can courses based on prerequisites not yet completed be undertaken.

## ADVANCED DEGREES

The degree of master of science is conferred upon graduates of this College and of other institutions after all the requirements incident to the bestowal of the degree have been complied with.

For graduates of this institution up to, and including, the class of 1916, the work for the degree of master of science consists of ninety-six credit units. The work of applicants who are graduates of other institutions is evaluated by a committee consisting of the chairman of the committee on advanced credit and of the dean of the division and the head of the department in which the major is to be taken, and the student is given proper standing.

Forty-eight of the required ninety-six credit units are designated as supplementary minors, and are to be derived from studies that are intended to strengthen the student's general preparation; the remaining forty-eight are taken from studies of a special nature. Of the forty-eight credit units derived from special training, thirty-two are given to the major subject and sixteen to the minors. The nature and distribution of the major and minors are determined in each individual case by a committee, consisting of the dean of the division and the head of the department in which the major is taken. Of the forty-eight credit units derived from special training, thirty-two may be allowed for original research; sixteen, designated as minors, must be obtained from departments other than that in which the major is taken. A candidate may be allowed not to exceed six credit units for investigational work done in line of instruction or department investigations, either in this institution or elsewhere. Whether this is considered a part of the major or a part of the minor depends on the character of the work. Candidates for the master's degree are required to spend at least nine months in resident advanced study.

Credit units due an honor student are applied on supplementary minors. In case a student nearing graduation has time, he may be permitted, by arrangement with the dean of the division and the head of the department in which he expects to do the major work, to spend his extra time on studies which will count toward the degree of master of science.

A thesis consisting of a clear statement of the investigation of some worthy original problem is required. The candidate is subjected to a rigid oral examination, covering both the general and special fields of his preparation, including his thesis, by a committee consisting of the dean of the division, the heads of the departments in which his major and regular minors have been taken, and the chairman of the standing committee on graduate study.

The full responsibility for the successful conduct of the graduate work is lodged in a representative standing committee of the Faculty, consisting of five members selected by the President, and this committee has the right to pass on all courses offered, on all assignments taken out, and on the standing of all graduate students.

## General Information

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### DUTIES AND PRIVILEGES

Good conduct in general, such as becomes men and women everywhere, is expected of all students. Every possible aid and stimulus toward the development of sound and rational character, and toward the formation of high standards of personal honor and ideals of conduct, is given by the various Christian organizations of the College and the town. Every student is accordingly expected to render a good account of himself in the College community life. For those who are high-minded and reasonable, no other requirements need be expected. On the other hand, the demands of the College life leave no room for the idle or self-indulgent, for those who are too reckless to accept reasonable or wholesome restraint, or for those who are too careless or indifferent to take proper advantage of their opportunities. The College discipline is confined chiefly to sending away those whose conduct, after fair trial, makes their further attendance at the College unprofitable or inadvisable.

Absences from class or laboratory periods must be accounted for to the instructor concerned. Permission for absence from College for one or more days must be secured in advance from the dean of the division in which the student is registered. Students can not honorably leave the College before the close of a term except by previous arrangement with the deans concerned.

Opportunities for general scientific, literary, and forensic training are afforded, in addition to the College courses, by various literary and scientific societies and clubs. The Science Club, meeting monthly, admits to membership all instructors and students interested in science. The College branch of the American Institute of Electrical Engineers, the Agricultural Association, and the Architectural Club admit to their membership young men interested in the fields indicated by their names. Of the strictly literary and debating clubs, the Alpha Beta and the Franklin are open to both sexes; the Ionian, the Eurodelphian, and the Browning are women's societies; the Webster, the Hamilton, and the Athenian admit only young men to membership. In the School of Agriculture there are three literary societies, two for young men, the Lincoln and the Representative, and one for young women, the Philomathian.

At various times during the year, the College halls are opened for social, literary, musical, and dramatic entertain-

ments furnished by lecture courses, by the literary societies, by the Department of Music, by the Dramatic Club, by the Oratorical Association, and by other organizations of students and instructors. Addresses by prominent speakers, men of affairs, and persons prominent in scientific, educational, and social work are of frequent occurrence.

### EXPENSES

Tuition is free. An incidental fee of three dollars a term is charged all students resident in Kansas. For nonresidents, a matriculation, or entrance, fee of ten dollars, and an incidental fee of ten dollars a term, are charged. A medical fee of fifty cents a term is also collected from each student, in return for which he receives medical treatment in case of sickness. Class instruction in music is free; for individual instruction a fee is required. In all laboratories students are required to pay for apparatus broken or lost and for supplies. No other fees are charged. Rooms and board are not furnished by the College. Table board in private families and at boarding houses varies from \$3.25 to \$4.50 a week, the average being about \$3.75. Rooms are obtainable at from \$5 to \$10 a month when occupied by one person, \$8 to \$12 when occupied by two. The highest-priced accommodations include light, heat, and bath.

The College Young Men's Christian Association offers accommodations in its building to a limited number of students, at prices from \$10 to \$13 a month for rooms with modern conveniences, and \$3.25 a week for table board. As the number of rooms in the building is limited, applications should be made to the secretary of the association a year in advance. Board can usually be obtained at any time.

Some students board themselves at less cost than the prices charged for table board, and unfurnished rooms may sometimes be obtained very cheaply. Washing costs from 50 to 75 cents a dozen pieces. Books cost on the average about \$5 a term.

Each young man who takes military drill is required to have a military uniform, costing about \$15, and each young woman who takes physical training must have a physical-training suit, costing about \$4. Ordinary expenditures, aside from clothing and traveling expenses, range from \$175 to \$300 a year.

### SELF-SUPPORT

The courses of instruction are based upon the supposition that the student is here for study, and therefore a proper grasp of the subjects can not be obtained by the average student unless the greater part of his time is given to college work. Students of limited means are encouraged and aided in every possible way, but unless exceptionally strong, both mentally



and physically, such students are advised to take lighter work by extending their courses, in case they are obliged to give any considerable time to self-support. As a rule, a student should be prepared with means for at least a term, as some time is required in which to make acquaintances and to learn where suitable work may be obtained.

There are various lines in which students may find employment. The College itself employs labor to the extent of about \$1200 a month, at rates varying from 15 to 20 cents an hour, according to the nature of the employment and the experience of the employee. Most of this labor is upon the College farm, in the orchards and gardens, in the shops and the printing-office, for the janitor, etc. Various departments utilize student help to a considerable extent during the vacations. Students demonstrating exceptional efficiency, ability, and trustworthiness obtain limited employment in special duties about the College. Many students secure employment in various lines in the town, and some opportunity exists for obtaining board in exchange for work, with families either in town or in the neighboring country. Labor is universally respected in the College community, and the student who remains under the necessity of earning his way will find himself absolutely unhampered by discouraging social conditions. False standards regarding physical work do not exist, and are not tolerated by the board of instruction or by the student body as a whole. Absolutely democratic standards prevail at the College, and students are judged on the basis of their personal worth and efficiency alone.

Students are assisted to obtain employment by means of the employment bureaus maintained by the Young Men's Christian Association and by the Young Women's Christian Association of the College, with secretaries of which organizations correspondence is encouraged. New students are also met at the trains by committees from these two bodies, and are assisted in the finding of rooms, and in various other helpful ways.

### BUSINESS DIRECTIONS

General information concerning the College may be obtained from the President or the Secretary. Financial matters are handled through the office of the Financial Secretary.

Scientific and practical questions, and requests for special advice along lines in which the College and the Experiment Stations are prepared to give information, should be addressed to the heads of the departments concerned with the work in which the information is sought.

Applications for farmers' institutes should be made as early in the season as possible to the Division of College Extension. Applications for the publications of the Agricultural Experi-

ment Station should be addressed: Director of the Agricultural Experiment Station, Manhattan, Kan.

Donations to the Library should be addressed to the Librarian, and donations to the Museum to the Curator of the Museum.

#### STUDENT ASSEMBLY

The Student Assembly is held from ten until ten-thirty o'clock on four mornings of each week. At this time, offices, class rooms and laboratories are closed and the students gather *en masse* in the College Auditorium. These assembly exercises consist of devotional services, music, and addresses. The devotional exercises are conducted by members of the Faculty, by resident ministers of the various denominations, or by prominent visitors. Excellent music is provided by the College Orchestra, by members of the Department of Music, and by available outside talent. In addition to the short, pointed addresses delivered by the President and by members of the Faculty, many prominent leaders of state and national reputation are invited to address the assembly. Thus the Student Assembly has become a center of true culture and enlightenment. Although attendance is not compulsory, it is common to see nearly two thousand enthusiastic students present during these exercises.

#### COLLEGE PUBLICATIONS

The official organ of the College is *The Kansas Industrialist*, published weekly by the Department of Industrial Journalism, and printed at the College by the Department of Printing. Its pages are filled with articles of interest, with special reference to agriculture and the industries. Particular attention is paid to information concerning the work of the College, to investigations of the Experiment Stations, and to local and alumni news. *The Kansas Industrialist* will be sent to any address for seventy-five cents a year. The alumni may have *The Kansas Industrialist* free upon application.

The Department of College Extension issues a monthly publication entitled *Agricultural Education*, of special interest to institute members. The students of the College publish a semi-weekly periodical, *The Kansas Aggie*, formerly "*The Students' Herald*," in the interest of the students at large. This paper is edited and managed by a staff elected by students. A College annual, *Royal Purple*, is published each year by the senior class.

#### EXAMINATIONS

Examinations are held at the last regular recitation periods of the respective studies at the end of each term. Whether the examination is to extend over the last two periods or over one only is left to the decision of the individual instructor. Ex-

aminations to remove conditions are held on the next to the last Saturday of each term. A student who has received the grade C is entitled to take such special examination, provided the instructor be notified of the student's desire to take the examination not later than the Tuesday evening preceding the Saturday set for the examinations. A grade of P only is to be reported for a student who passes the examination to remove a condition. A grade of F is to be reported for one who fails to pass. If a subject in which a student is conditioned is not passed at the first opportunity, the grade is changed from C to F. The instructor will report as incomplete (I) any student whose work, while satisfactory in quality, is lacking in the quantity required. The grade I in such cases is removed when the student completes the required quantity of work in a satisfactory manner. With the consent of the head of the department, incomplete work may be made up outside of class, but if it is not made up by the last Saturday of the first term during which the student is in attendance following the term in which the deficiency occurred, the student's grade is changed from I to F, and he is required to make up the work by repeating it in a regular class. Incomplete work made up is to be reported as P.

Permission for examination in subjects not taken in class must be obtained, on recommendation of the professor in charge, from the dean of the division in which the student is assigned, at least two months before the examination is held. Permission to take such examination is not granted unless the preparation for it is made under an approved tutor. All such examinations are under the immediate supervision of the professor in whose department the subject falls.

### GRADES

Students' grades are based upon the completed work of a term, and are designated by letters having the following signification and rank:

E, excellent; G, good; P, passed; C, conditioned; I, incomplete (applied to all work which is satisfactory as to quality, but not as to quantity); F, failed.

Any student who receives a grade of E for the term, in any subject, and who is charged with not to exceed six absences for all causes from the class in such subject during the term, may be excused from the final examination in that subject, at the discretion of the instructor; provided, however, that instructors are to announce such exemption lists in their respective subjects not earlier than the last session of the class preceding the final examinations.

Examinations to remove conditions are reported simply as P (passed) or F (failed), and such examinations not taken, or taken and not passed, are recorded as F (failed).

## PENALTIES

A student who at the end of the term receives grades below passing in fifty per cent or more of the work to which he is assigned is required to leave college for at least one term unless there are sufficiently extenuating circumstances, in which case his dean may suspend the rule and allow an assignment to twelve credit units of work.

Any student who, at the end of a term, receives grades below passing in twenty-five per cent of his assigned work is allowed not more than seventy-five per cent of regular work the next term.

Any student who is found to be persistently inattentive to study is at once temporarily suspended by his dean, and reported to the President for permanent suspension.

## HONORS

In each of the divisions of the College "junior honors" are awarded at Commencement to not more than five per cent of the junior class having the highest standing up to the close of the junior year.

In a similar manner "senior honors" are awarded to not exceeding five per cent of the senior class having the highest standing to the close of the senior year.

Any student achieving senior honors receives two credit units toward the master's degree; a student achieving both junior and senior honors receives six credit units toward the master's degree.

The following is the system of awarding honor points: The grades received by the student carry plus and minus "points" as follows:

- Grade E (excellent) carries + 2 points.
- Grade G (good) carries + 1 point.
- Grade P (passed) carries 0 point.
- Grade C (conditioned) carries — 1 point.
- Grade F (failed) carries — 2 points.

When grade C (conditioned) is subsequently changed by the examination to remove a condition to grade P (passed) or grade F (failed) the points are changed accordingly.

In the estimation of honor points, the number of points attached to any given grade is multiplied by the number of hours a week required in the subject. In the case of a subject consisting wholly or in part of shop practice or laboratory work, *one-half* the number of hours required in such shop practice or laboratory work is taken in computing the multiplying factor.

The award of honors is to those achieving the highest *algebraic sum* of honor points, according to the foregoing schedule, and under the limitations provided above.

## CREDITS FOR EXTRA WORK

Activities connected with the College, but not provided for by any of the courses of study, either as required subjects or as electives, are designated as *extra* subjects.

No credit is given for extra work of any kind unless the student is regularly assigned to it in accordance with the general rules governing assignments, and it is done under the constant supervision of a College officer, who sees that a proper standard is maintained and reports a grade for record.

No student may be assigned to extra work for credit except upon the written recommendation of the instructor in charge of the work. This recommendation is filed in the office of the student's dean, and is effective until revoked.

Credits earned for extra work may be counted as part or all of the electives in any of the College courses. In courses that do not include electives, credits for extra work are available only as substitutions for required work, and must be approved in the regular way before becoming effective. A total of not more than twelve credit units may be allowed a student for extra work, and not more than two credits may be obtained in any one term.

The credit units that may be allowed for extra work are as follows:

Subject.	Per term.	Total.
Physical training .....	1	6
Military drill (unpaid) .....	1	6
Orchestra .....	1	6
Band .....	1	6
Glee Club .....	1	6
Debate .....	2	6
Oratorical contest .....	2	4
Kansas Aggie Journalism.....	1	6

## CLASSES

The minimum numbers for which classes are organized are as follows:

School of Agriculture .....	18
Freshmen or Sophomores .....	12
Juniors or Seniors .....	7

This rule is varied only by special permission of the Board of Administration.

## School of Agriculture

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The School of Agriculture is organized to meet the needs of young men and young women of Kansas who may need instruction more closely identified with the life of the farm, home and shop than that provided by the high schools of the State. It is also intended to meet the needs of those men and women who find themselves for any cause unable to complete an extensive course of collegiate instruction, yet who feel the necessity of a practical training for their activities in life. More than one-half of the student's time in the school will be spent in the laboratories and in contact with the real objects of his future work. An element of culture and general information is provided for in three years of English for each course, and in work in history, economics, citizenship, physics, and chemistry.

The School of Agriculture is not a school preparatory to the College. Its sole purpose is to fit men and women for life in the open country, and to make country life more attractive; to make the workshop more efficient; in short, to dignify and to improve industrial life. It is not established to entice students away from the high school. It is for those of every walk in life who wish a larger view and greater skill in doing the world's work.

All the resources of the College are at the disposal of the School of Agriculture. Its students have every advantage possessed by students in the College.

### THE COURSE OF STUDY

The course in agriculture emphasizes the growing of crops and the raising of live stock. A minimum of theory and a maximum of practical work will bring the student into close contact with the actual conditions of farm life.

The course in domestic science emphasizes the care of the home. Home decoration, home sanitation, cookery and sewing receive careful attention.

The course in mechanic arts leads to a trade. It is designed to shorten the time of apprenticeship and to prepare the way for skilled workmanship in shop or factory. The great amount of time spent in the shops should easily lead to skill and efficiency in subsequent work.

### ADMISSION

Students who are fourteen years of age or older and who have completed the eighth grade of the public schools are admitted without examination. Students who have not completed the eighth grade are examined in arithmetic, United States history, English grammar, geography, reading, and spelling. Students who have done work in the public high schools receive credit for the work done. Maturity in years and practical experience are given due consideration, but students should not consider these qualifications alone sufficient to admit them. Wherever there is question about a student's qualifications for entering, he should correspond with the Principal of the School of Agriculture before coming.

### TIME OF OPENING

All candidates for admission to the School of Agriculture should present themselves for registration at the College September 14 to 17, inclusive. The Principal of the School of Agriculture is charged with the execution of all College and Faculty rules relating to the enrollment of students in classes and their choice of studies.

It is greatly to the advantage of the prospective student to see to it that his certificate of graduation, properly filled out, be sent to the College as soon as possible after graduation. A permit to register will then be sent him by the Registrar in advance of his coming in September; this will greatly facilitate the work of entrance. The student will present this permit at the registration room in Nichols Gymnasium and will not be compelled to wait his turn to meet the committee on admission.

Upon registration each student receives a certificate of his standing, which he presents to the Principal of the school, who is charged with the duty of enrolling students in classes, selecting and arranging subjects, and assigning hours.

### GRADES AND FAILURES

Examinations are held at stated periods and at such other times as the Faculty may provide. Absence from examination, or ten or more unexcused absences from class periods, sever a student's connection with the institution, which connection can be renewed only through the action of the Principal of the school. Any withdrawal from school or class must be authorized by the Principal; otherwise, continued absence is construed as failure. Parents or guardians are furnished a copy of the record of the student's work at the close of any term if they so desire.

## Course in Agriculture

(SCHOOL OF AGRICULTURE.)

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

### FIRST YEAR

FALL	WINTER	SPRING
Industrial Arithmetic A 4 (4-0)	Algebra 4 (4-0)	Applied Geometry 4 (4-0)
General Biology I 4 (2-4)	General Biology II 4 (2-4)	General Biology III 4 (2-4)
Stock Judging I 3 (0-6)	Beginning Poultry 3 (2-2)	Grain Crops 4 (3-2)
Farm Machinery 3 (1-4)	Farm Carpentry 3 (1-4)	Farm Blacksmithing 3 (1-4)
English Readings 4 (4-0)	Grammar and Composition 4 (4-0)	Elementary Composition I 4 (4-0)
Military Drill or Physical Training Music*	Military Drill or Physical Training Music*	Military Drill or Physical Training Music*

### \*\*SECOND YEAR

El. Chemistry I 4 (3-2)	El. Chemistry II 4 (3-2)	El. Agricultural Chemistry 4 (3-2)
English History 4 (4-0)	American History 4 (4-0)	Civics 4 (4-0)
English Classics I 4 (4-0)	Elementary Composition II 4 (4-0)	Elementary Rhetoric 4 (4-0)
Gardening I 3 (2-2)	Rural Economics 3 (3-0)	Farm Insects 3 (3-0)
Stock Judging II 3 (0-6)	Breeds and Breeding 3 (3-0)	Feeds and Feeding 3 (3-0)
Physical Training Music*	Physical Training Music*	Physical Training Music*

### THIRD YEAR

Forage Crops 3 (2-2)	Farm Management and Farm Accounts 4 (3-2)	Soils and Fertilizers 4 (3-2)
Physics A-I 4 (3-2)	Physics A-II 4 (3-2)	Physics A-III 4 (3-2)
Diseases of Farm Animals 3 (3-0)	Live Stock Production 3 (3-0)	Dairy 3 (2-2)
Gas and Oil Engines I 3 (1-4) or	Agricultural Bacteriology 4 (3-2)	Conference English 4 (4-0)
Grain Marketing 3 (2-2)	Handling and Curing Meats 3 (1-4) or	Forestry and Ornamental Gardening 3 (2-2) or
Theme Writing 4 (4-0)	Farm Writing 3 (2-2) or	Irrigation and Drainage 3 (1-4)
	Farm Buildings 3 (0-6)	

\* Elective.

\*\* See page 94 for announcement of summer project or demonstration work for credit.



## Course in Mechanic Arts

(SCHOOL OF AGRICULTURE.)

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

## FIRST YEAR

FALL	WINTER	SPRING
English Readings 4 (4-0)	Grammar and Composition 4 (4-0)	Elementary Composition I 4 (4-0)
Algebra I 4 (4-0)	Algebra II 4 (4-0)	Algebra III 4 (4-0)
European History I 4 (4-0)	European History II 4 (4-0)	American History 4 (4-0)
Free-hand Drawing 3 (0-6)	Object Drawing 3 (0-6)	Geometrical Drawing 3 (-)
Woodwork I 4 (1-6)	Elementary Foundry 4 (1-6)	El. Blacksmithing I 3 (1-4)
Vocational Guidance I 1 (1-0)	Vocational Guidance II 1 (1-0)	Trade Practice* 3 (0-6)
Military Drill <i>or</i> Physical Training	Military Drill <i>or</i> Physical Training	Military Drill <i>or</i> Physical Training

## SECOND YEAR

English Classics I 4 (4-0)	Elementary Composition II 4 (4-0)	Elementary Rhetoric 4 (4-0)
Plane Geometry I 4 (4-0)	Plane Geometry II 4 (4-0)	Solid Geometry 4 (4-0)
Physics M-I 4 (3-2)	Physics M-II 4 (3-2)	Physics M-III 4 (3-2)
Shop Drawing I 3 (1-4)	Shop Drawing II 3 (1-4)	Shop Drawing III 3 (1-4)
Trade Practice* 6 (-)	Trade Practice* 6 (-)	Trade Practice* 6 (-)
Physical Training	Physical Training	Physical Training

## \*\*THIRD YEAR

Industrial History 4 (4-0)	Civics 4 (4-0)	Economics 4 (4-0)
Algebra IV 4 (4-0)	Applied Mathematics 4 (4-0)	Conference English 4 (4-0)
Trade Practice* 12 (-)	Trade Practice* 12 (-)	Trade Practice* 12 (-)

\* Trade Practice may be elected in one of the following trades: Blacksmithing, Carpentry, Cement and Concrete Construction, Gas Engines, Steam Engines and Boilers, Traction Engines. Details of the Trade Practice work for each course will be found on page 107 and following.

\*\* No Trade Practice work listed in the third year will be offered during the college year 1914-1915.

## Course in Home Economics

(SCHOOL OF AGRICULTURE.)

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

## FIRST YEAR

FALL	WINTER	SPRING
English Readings 4 (4-0)	Grammar and Composition 4 (4-0)	Elementary Composition I 4 (4-0)
Industrial Arithmetic W 4 (4-0)	Algebra 4 (4-0)	Applied Geometry 4 (4-0)
Physiology and Hygiene 4 (4-0)	Home Sanitation 4 (4-0)	Home Management 4 (4-0)
Color and Design I 3 (0-6)	Color and Design II 3 (0-6)	Home Decoration 4 (0-8)
Sewing I 2 (0-4)	Sewing II 2 (0-4)	Sewing III 2 (0-4)
Physical Training	Physical Training	Physical Training
Music*	Music*	Music*

## SECOND YEAR

English Classics I 4 (4-0)	Elementary Composition II 4 (4-0)	Elementary Rhetoric 4 (4-0)
English History 4 (4-0)	American History 4 (4-0)	Civics 4 (4-0)
Physics H-I 4 (3-2)	Physics H-II 4 (3-2)	Physics H-III 4 (3-2)
Household Entomology 2 (2-0)	El. of Poultry Keeping 2 (2-0)	Dairying 2 (0-4)
Cooking I 2 (0-4)	Cooking II 2 (0-4)	Cooking III 2 (0-4)
Sewing IV 2 (0-4)	Shirt-waist Suit 2 (0-4)	Dressmaking 2 (0-4)
Physical Training	Physical Training	Physical Training
Music*	Music*	Music*

## THIRD YEAR

Theme Writing 4 (4-0)	Practice Writing 4 (4-0)	English Classics II 4 (4-0)
Elementary Chemistry I 4 (3-2)	Elementary Chemistry II 4 (3-2)	El. Household Chemistry 4 (3-2)
Economics 4 (4-0)	Household Bacteriology 4 (3-2)	Gardening I 3 (2-2)
Cooking IV 2 (0-4)	Cooking V 2 (0-4)	Cooking VI 2 (0-4)
Textiles 2 (2-0)	Costume Design 2 (0-4)	Advanced Dressmaking 2 (0-4)
Art Needlework 2 (0-4)	Millinery 2 (0-4)	Food Production 3 (3-0)
Physical Training*	Physical Training*	Physical Training*
Music*	Music*	Music*

\* Elective.

## Agricultural Courses

### AGRONOMY

1.—FARM MACHINERY. First year, fall term. Class work, one hour; laboratory, four hours. Three credits.

In this course the student is taught in the class room the mechanical principles of the different types of farm machinery, and in the laboratory and the field is taught to adjust and operate the machines properly. Instruction is also given in fence construction, rope splicing, and cement work.

2.—GRAIN CROPS. First year, spring term. Class work, three hours; laboratory, two hours. Four credits.

This course consists of a study of grain-crop production. The factors that affect the yield of grain crops are given the greatest consideration. These factors include crop adaptation, methods of planting, methods of cultivation, and methods of harvesting. In order that such study may be of the greatest value, the structure of the plants and methods of improvement are considered. The greatest emphasis is placed upon the economic production of the crops. Eight grain crops are included in the study, being given consideration in accordance with their importance in the State.

3.—FORAGE CROPS. Third year, fall term. Class work, two hours; laboratory, two hours. Three credits.

This course takes up the culture, adaptation, distribution and uses of crops for pasture, hay, roughage, silage, soiling; cover crops; green manure crops. The use of these crops for the maintenance of soil fertility, together with their importance in systems of cropping and rotation, is given special emphasis. The seed production of grasses, legumes, annuals and forage crops is also studied.

*Laboratory.*—The laboratory work of this course is planned to give the student training in the identification of seeds and plants studied in the class. A study is made of the quality, mixtures and adulteration of seeds. Prerequisites: Grain Crops; General Biology III.

4.—FARM MANAGEMENT AND FARM ACCOUNTS. Third year, winter term. Class work, three hours; laboratory, two hours. Four credits.

The purpose of this course is to correlate in a definite manner the information relating to farming that the student has accumulated in other agricultural courses. The course involves a study of the selection of farms, plans and arrangement of fields and farm buildings, and the investment and proper distribution of capital in the farming business. The relation of live-stock farming to crop farming, and the most profitable combinations of these, together with their effect upon soil fertility and the upbuilding of the farm, are considered. Farm accounts and records are studied, and special emphasis is given to systems of account keeping that are accurate, simple, and applicable to farm conditions. Prerequisites: Forage Crops; Live Stock III.

5.—SOILS AND FERTILIZERS. Third year, spring term. Class work, three hours; laboratory, two hours. Four credits.

This course involves discussion of depth of plowing for different crops, the conservation of moisture, and the handling of soils to prevent blowing. This course also involves a study of the care and use of barnyard manure, of green manuring crops, and of commercial fertilizers. Prerequisites: Agricultural Chemistry; Forage Crops.

6.—IRRIGATION AND DRAINAGE. Third year, spring term. Class work, one hour; laboratory, four hours. Three credits.

This course offers an opportunity for students who are interested in either irrigation or drainage to become familiar with the fundamental principles underlying both these practices. Practical work is given in the field in the use of the level, in digging drainage ditches, in laying tile, and in studying drainage systems in operation on the College farm and adjoining farms.

7.—HOME PROJECT OR DEMONSTRATION WORK. Summer vacations. Maximum credits, eight; four each vacation.

Students in the course in agriculture of the School of Agriculture may, upon recommendation of the Principal, earn not to exceed four credits during each of the two summer vacations by doing project or demonstration work on the home farm. This work must be arranged for with the head of the department in charge of the work of the College, and must be approved by the Dean of the Division of Agriculture. The work must include a detailed plan of the project, a report of work done, and a final report of results. The amount of credit given for a project shall be determined by the head of the department, but shall in no case exceed four credit hours for the work of one summer.

### DAIRYING

1.—DAIRY COWS. Second year, term. Laboratory, six hours.

This course is given as a part of Stock Judging II. Two weeks is devoted to the judging of dairy cattle.

2.—DAIRY. Third year, spring term. Lectures, two hours; laboratory, two hours. Three credits.

This course includes lectures on milk and its composition, Babcock testing, separation, churning, and feeding the dairy herd.

*Laboratory.*—The laboratory work comprises the operation of the Babcock test, testing separators, churning, and judging dairy cattle.

3.—DAIRYING. Second year, spring term. Laboratory, four hours. Two credits.

Lectures are given at different times during the course, which includes a study of the composition and the secretion of milk, the Babcock test, the principles of separation, the care of milk and cream, cream ripening, butter making, and fancy cheese making.

*Laboratory.*—This work includes testing milk and cream by the Babcock test, separating milk, churning, and fancy cheese making.

### FORESTRY

1.—FORESTRY AND ORNAMENTAL GARDENING. Lectures, two hours; laboratory, two hours. Three credits. Optional in the spring term of the third year of the course in agriculture.

This course covers the principles and methods involved in tree planting, both for the wood-lot and for decorative purposes. The laboratory work consists in making plans for planting home grounds.

### HORTICULTURE

1.—GARDENING I. Lectures, two hours; laboratory, two hours. Three credits. Required in the home economics and agricultural courses.

This course will consist of a study of the principles and practices involved in the care and cultivation of market and home gardens.

## LIVE STOCK

1.—STOCK JUDGING I. First year, fall term. Laboratory, six hours. Three credits.

This course consists in score-card practice in judging horses, cattle, sheep and swine, in which the students become familiar with the general points to be observed in judging live stock. Text, Craig's *Live-stock Judging*.

2.—STOCK JUDGING II. Second year, fall term. Laboratory, six hours. Three credits.

This course consists of the study of the breeding and market types of horses, cattle, sheep and swine. Two weeks of this time is given to the study of dairy cattle, presented by the Department of Dairy Husbandry.

3.—BREEDS AND BREEDING. Second year, winter term. Class work, three hours. Three credits.

This course consists of the study of pure-bred horses, cattle, sheep and swine, and the methods practiced by the best breeders. It also embraces the study of the general principles of breeding, such as variation and heredity. Text, Marshall's *Breeding Farm Animals*.

4.—FEEDS AND FEEDING. Second year, spring term. Class work, three hours. Three credits.

This course involves the study of the comparison and usefulness of various feeds for growing and fattening all classes of farm animals. Text, Henry's *Feeds and Feeding*.

5.—LIVE-STOCK PRODUCTION. Third year, winter term. Class work, three hours. Three credits.

This course consists of a study of successful and economical methods of growing and finishing cattle, sheep and hogs for market purposes, as well as the breeding of both market and pure-bred animals.

6.—HANDLING AND CURING MEAT. Optional course, third year, winter term. Class work, one hour; laboratory, four hours. Three credits.

This course consists of a study of methods of slaughtering and dressing animals, cutting up carcasses into wholesale and retail cuts, and curing meat for farm use. Laboratory work is offered in killing small animals. Prerequisite: Breeds and Breeding.

## MILLING INDUSTRY

1.—GRAIN MARKETING. Third year, fall term. Class work, two hours; laboratory, two hours. Three credits.

In this course are studied methods of harvesting, handling and storing of grain, together with the marketing of surplus grain from the farm. This involves methods of selling, shipping and grading grain; organization of grain inspection departments, with their merits and defects; the principal grain markets, with receipts, shipments, and grain consumed. The by-products resulting from the manufacture of food products from grain will be studied with regard to their feeding value and comparative cost.

## POULTRY

1.—BEGINNING POULTRY. First year, winter term. Offered in the course in agriculture. Recitation, two hours; laboratory, two hours. Three credits.

This course takes up a discussion of the various operations that go to make up the art of poultry-keeping.

*Laboratory.*—The laboratory study will include work in dressing, packing, and caponizing.

2.—ELEMENTS OF POULTRY-KEEPING. Second year, winter term. Offered in the course in home economics. Recitation, two hours. Two credits.

This course is a duplicate of Poultry 1, except that no laboratory work is required.

### VETERINARY MEDICINE

DISEASES OF FARM ANIMALS. Third year, fall term. Class work, three hours. Three credits.

This course is intended to teach the student the recognition of disease, the principles involved in the preservation of health, and the application of first aid in disease or accident among farm animals. The various diseases resulting from the use of spoiled foods or the improper or injudicious use of good foods are discussed. The value of food, care and nursing of the sick animal is thoroughly impressed upon the student. The common infectious diseases and the means for their prevention and eradication are also considered. Text, Burkett's *Farmer's Veterinarian*.

## General Science Courses

### BACTERIOLOGY

1.—AGRICULTURAL BACTERIOLOGY. Third year, winter term. Lectures, three hours; laboratory, two hours. Four credits. Required in the course in agriculture.

An elementary course in the principles of bacteriology is here offered, taking up bacteriological problems from an entirely practical standpoint. The course is offered in order to give the student a reading knowledge of the sources and modes of infection; the relation of bacteriology to dairying and to soils and crop production; general sanitation; fermentations, etc.

*Laboratory.*—General laboratory manipulations; normal and abnormal fermentations of milk and milk products; quantitative study of bacteria in the soil; a limited study of fermentations, of pathogenic bacteria, of sewage pollution of water, etc., comprise the laboratory work.

2.—HOUSEHOLD BACTERIOLOGY. Third year, winter term. Lectures, three hours; laboratory, two hours. Four credits.

This course includes a general survey of the science of bacteriology as applied to the home. It includes a discussion of microorganisms as related to air, water, foods, general sanitation, fermentations, etc. An attempt is made to present the subject in as simple a manner as possible. The course is offered in the hope of giving the student a general understanding of the fundamentals, and a reading knowledge of the science.

*Laboratory.*—Various microscopic forms of importance in fermentations; preservation and spoilage of foods; the influence of various preservatives upon microorganisms common in the home; methods of sterilization and of pasteurization; the handling of infectious material, etc., are the subjects taken up in the laboratory work.

### BIOLOGY

1.—GENERAL BIOLOGY I. First year, fall term. Class work, two hours; laboratory, four hours. Four credits.

This course involves an elementary study of the biology of plants, including the simpler facts of their structure and of their physiology. The life history of a seed plant is followed from the germination of the seed to maturity, and the structure and work of the root, stem and leaf systems is studied in some detail. The biology of the flower and its peculiar

adaptations to insect- or wind-pollination is emphasized, as well as the manner in which seeds and fruits are distributed. Throughout the course emphasis is laid on the relations of plants to light, air, water, and soil, and on the relation between the biology of plants in agricultural practice.

2.—GENERAL BIOLOGY II. First year, winter term. Class work, two hours; laboratory, four hours. Four credits.

This course is intended to teach the student the elementary principles of physiology and also the gross structure or anatomy of the body. Comparisons are made with the domestic animals as often as possible. The lectures are supplemented by the use of models and dissections by the instructor when necessary. There is an abundance of apparatus for demonstrating purposes, and demonstrations are made frequently in order to make the course interesting and instructive.

3.—GENERAL BIOLOGY III. First year, spring term. Class work, two hours; laboratory, four hours. Four credits.

This course deals with the natural history of animals. The laboratory work consists of one four-hour period a week. This work is carried on for the most part out of doors. The ponds and streams, meadows and woodlands are visited and the animals studied in their relation to each other and to their environments. Numbers of animals are brought to the laboratory, where they are kept in vivaria and such study given them as is not permitted out in the field. The two hours of class work are devoted to résumés of the field and laboratory work and to general matters of animal biology.

## CHEMISTRY

1.—ELEMENTARY CHEMISTRY I. Lectures and recitations, three hours; laboratory, two hours. Four credits. Required in the courses in agriculture and home economics. Prerequisite: Elementary Physics.

The work this term is an elementary study of the general principles of chemistry, using the elements oxygen, hydrogen, nitrogen, chlorine, and carbon, and their most important compounds, as its basis. So far as possible, illustrations are drawn from practical life on the farm and in the home. The laboratory work is designed to give the student some knowledge of the essential features of chemical change, as well as to familiarize him with some of the more important elements and chemical compounds. Textbook, McPherson and Henderson's *Elementary Study of Chemistry*.

2.—ELEMENTARY CHEMISTRY II. Lectures and recitations, three hours; laboratory, two hours. Four credits. Required in the courses in agriculture and home economics. Prerequisite: Elementary Chemistry I.

The work this term is a continuation of that begun in Elementary Chemistry I. Sulphur and phosphorus and to a slight extent other non-metals and their compounds are studied. This work is followed by some study of the most important metals and their compounds. The practical aspects of the subject are emphasized throughout. Textbook, McPherson and Henderson's *Elementary Study of Chemistry*.

3.—ELEMENTARY HOUSEHOLD CHEMISTRY. Lectures and recitations, three hours; laboratory, two hours. Four credits. Required in the course in home economics. Prerequisite: Elementary Chemistry II.

In the work of this term, chemistry is studied in its more direct application to the household. The course includes not only some special applications of inorganic chemistry, but simple organic chemistry, especially in its relation to foods. The laboratory work is an application of chemistry to various household problems touching water, foods, textiles, and utensils. Textbook, Snyder's *Chemistry of Plant and Animal Life*.

4.—ELEMENTARY AGRICULTURAL CHEMISTRY. Lectures and recitations, three hours; laboratory, two hours. Four credits. Required in the course in Agriculture. Prerequisite: Elementary Chemistry II.

The general principles of chemistry are presented as applicable on the farm in relation to soils, fertilizers, dairy products, feeds, water, etc. The laboratory work is made as practical as possible. Textbook, Snyder's *Chemistry of Plant and Animal Life*.

## ECONOMICS

1.—RURAL ECONOMICS. Second year, winter term. Class work, three hours. Three credits. Required in the course in agriculture.

This course is an introductory study of economic principles as they apply to the business of farming. Special attention is given to co-operation in its relation to rural credit, production, and exchange. Special emphasis is placed on the details of distribution and marketing of the products of the farm and to the purchase of the supplies of the family. Instruction is based on a text, bulletins, and assigned library readings.

2.—ECONOMICS. Third year, fall or spring term. Class work, four hours. Four credits. Required in the courses in home economics and mechanic arts.

This course is a study of fundamental principles underlying man's wealth-getting and wealth-using activities, and their application to conditions and problems of the industries of to-day. Instruction is based on a text, assigned readings, and reports.

## ENGLISH

1.—ENGLISH READINGS. First year, fall term. Class work, four hours. Four hours credit. Required of all students.

In this course a careful study is made of interesting standard literary selections. Class readings, class discussions, written sketches, abstracts, and outlines, and training in the practical use of the dictionary, give the student the opportunity to grow in the power to think clearly and to express himself accurately. This course is enriched by interesting outside readings.

2.—GRAMMAR AND COMPOSITION. First year, winter term. Class work, four hours. Four hours credit. Required of all students. Prerequisite: English Readings.

This course is a review of the essentials of the English language. Short, interesting selections are studied definitely and interpreted clearly. The correct thought-interpretation of ordinary English sentences is taught in connection with the selections read and studied. The aim is to give little theory and much practice in the intelligent use of the language.

3.—ELEMENTARY COMPOSITION I. First year, spring term. Class work, four hours. Four hours credit. Required of all students. Prerequisite: Grammar and Composition.

The work of this term includes: instruction in the elementary principles of composition; advanced drill in the use of the dictionary; the study of words and sentences; special drills in punctuation; exercises in letter writing; drills in abstracting; and the writing of short themes. Special personal help is given the student at consultation hours.

4.—ENGLISH CLASSICS I. Second year, fall term. Class work, four hours. Four hours credit. Required of all students. Prerequisite: Elementary Composition I.

The work of this course is centered in the study of selected literary masterpieces. The careful preparation of outlines, sketches, paraphrases, and abstracts, class readings, general class discussions, and special exercises in interpreting character and life, are essentials of the term's work.



5.—ELEMENTARY COMPOSITION II. Second year, winter term. Class work, four hours. Four hours credit. Required of all students. Prerequisite: English Classics I.

This course is a continuation of Elementary Composition I. The course opens with a brief review of the sentence as the grammatical unit of thought-expression, and continues with a thorough study of the paragraph as the rhetorical unit. Special emphasis is placed upon practical writing on topics of keenest interest to the pupil.

6.—ELEMENTARY RHETORIC. Second year, spring term. Class work, four hours. Four hours credit. Required of all students. Prerequisite: Elementary Composition II.

This course includes a general survey of description, narration, exposition, and argumentation, with special emphasis placed upon clear, interesting, effective oral and written expression. Special exercises in punctuation, short drills in proofreading, drills in outlining, abstracting, oral discussions, and elementary debating, are also emphasized in this course.

7.—THEME WRITING. Third year, fall term. Class work, four hours. Four hours credit. Required of all students in the courses in agriculture and home economics. Prerequisite: Elementary Rhetoric.

Special emphasis is placed upon exposition, or clear-cut explanation. Pupils are trained to tell accurately and interestingly how things are done in various fields of human activity. This course is conducted with the idea of assisting the student to acquire the habit of clear, accurate thought-getting and thought-expression in all of his technical work.

8.—PRACTICE WRITING. Third year, winter term. Class work, four hours. Four hours credit. Required of students in the course in home economics. Prerequisite: Theme writing.

This course includes a short review of practical exposition, a thorough study of the principles of narration, and the analysis and writing of narrative paragraphs and short stories. Short stories of the farm and home, stories of country life, and other human-interest stories, are required.

9.—ENGLISH CLASSICS II. Third year, spring term. Class work, four hours. Four hours credit. Required of students in the course in home economics. Prerequisite: Practice Writing.

This course is designed to afford an additional drill and study in the cultural side of literature and language. The student is given a bird's-eye view of the field of literature, with an intensive study of representative classics from Shakespeare, Tennyson, and other authors. This intensive study of representative classics is broadened and enriched by well-selected supplementary reading.

10.—CONFERENCE ENGLISH. Third year, spring term. Class work, four hours. Four hours credit. Required of all students in the courses in agriculture and mechanic arts. Prerequisite: Theme Writing.

This course includes a thorough review of the essentials of English. Special emphasis is placed upon the ability to write and to tell accurately the thought to be conveyed. This course requires of all students daily practice in oral and written English, and includes regular conferences and consultations with students on matters concerning their greatest needs in the use of language. The course is designed with special reference to the needs of students in engineering and in agriculture.

## ENTOMOLOGY

1.—FARM INSECTS. Second year, spring term. Class work, three hours. Three credits. Required in the course in agriculture. Prerequisite: General Biology.

This is a study of the elementary anatomy, structure and physiology of insects, complete enough to give a clear understanding of the general structure of insects and the underlying facts upon which the scientific application of remedial or preventive measures is based. All of the more important insects of the farm, garden, and orchard are discussed at sufficient length to give a clear idea of their life histories and habits, together with the best means of control. The class work consists of lectures and text.

2.—HOUSEHOLD ENTOMOLOGY. Second year, fall term. Class work, two hours. Two credits. Required in the course in home economics. Prerequisite: General Biology.

This course consists of illustrated lectures and reference reading on the habits, life history and general methods of control of the principal insects injurious to house, garden, lawn, and human health.

## HISTORY

1.—EUROPEAN HISTORY I. First year, fall term. Class work, four hours. Four credits. Required in the course in mechanic arts.

This course will be introduced by a few lectures on the ancient world, but will take up the more serious part of the work at the fall of Rome and the very beginnings of modern European nationalities and languages, and will trace the story of European history and institutions to the end of the seventeenth century. Text, Robinson's *Introduction to the Study of Western Europe*, pages 1-537.

2.—EUROPEAN HISTORY II. First year, winter term. Class work, four hours. Four credits. Required in the course in mechanic arts.

This course is a continuation of European History I, and covers the period from the opening of the eighteenth century to the present day. Emphasis is placed on present conditions and current events throughout the world. Text, Robinson and Beard's *Outlines of European History*, Part II.

3.—ENGLISH HISTORY. Second year, fall term. Class work, four hours. Four credits. Required in the course in agriculture and in the course in home economics.

This is a course in the history of England, with some attention to contemporary European history and institutions, and serves as a background for the course in American history. Text, Andrews', Coman and Kendall's, Walker's, or Wrong's.

4.—AMERICAN HISTORY. First year, spring term, or second year, winter term. Class work, four hours. Four credits. Required of all students in the School of Agriculture.

This corresponds to high-school courses in American History. It should be preceded by the course in English History or by the courses in European History I and II. This course will be based on Muzzey's *American History* as the text, but a limited amount of library work will be required.

5.—CIVICS. Second year, spring term, or third year, winter term. Class work, four hours. Four credits. Required of all students in the School of Agriculture.

This is not a course of the old type, usually called civil government, nor a course in constitutional law, but a vigorous course in the actual workings of our present-day governmental and political activities. Text, Guitteau's *Government and Politics in the United States*.

6.—INDUSTRIAL HISTORY. Third year, fall term. Class work, four hours. Four credits. Required in the course in mechanic arts.

This is a new course, devoted to a study of American industrial life; how industries have developed, how they have modified history and government, and how in turn they have been modified by historical development and governmental regulations. This course is based primarily on Bogart's *Economic History of the United States*, second edition.

### INDUSTRIAL JOURNALISM

FARM WRITING. Third year, winter term. Class work, two hours; laboratory, two hours. Three credits. Required in the course in agriculture.

One term's work is given in the elementary principles of writing for farm papers, newspapers, or magazines on agriculture, home economics, mechanical engineering and other industries taught in the College.

### MATHEMATICS

1.—INDUSTRIAL ARITHMETIC A. First year, fall term. Class work, four hours. Four credits. Required in the course in agriculture.

The course has two distinct aims: (1) a practical knowledge of the principles of numbers, both integral and fractional; (2) the practical application of these principles to problems of the farm and the shop. A large number of problems arising from actual experience over the whole field of agricultural science will be made the basis of problem work. Farm investments, farm accounts, and farm values will receive special attention. Text, Stevens and Butler's *Practical Arithmetic*.

2.—INDUSTRIAL ARITHMETIC W. Fall term. Class work, four hours. Four credits. Required in the course in home economics.

The course follows the lines of Industrial Arithmetic A, except that the points of emphasis are varied to meet the needs of young women. Text, Stevens and Butler's *Practical Arithmetic*.

3.—ALGEBRA. First year, winter term. Class work, four hours. Four credits. Required in the courses in agriculture and home economics.

The course includes an introduction to the first principles of algebra; the use and meaning of symbols; simple problems in algebraic reckoning; the solution of the simplest equations of the first and second degrees; careful practice in the evolution of algebraic formulæ; first ideas of graphical analysis and the functional relation. Textbook, Wentworth and Smith's *Vocational Algebra*.

4.—ALGEBRA I. First year, fall term. Class work, four hours. Four credits. Required in the course in mechanic arts.

This course includes a study of the four fundamental operations, integral linear equations, and factoring. Text, Hawkes, Luby, and Touton's *First Course in Algebra*.

5.—ALGEBRA II. First year, winter term. Class work, four hours. Four credits. Required in the course in mechanic arts.

Equations treated by factoring; fractions; fractional and literal linear equations; simultaneous linear equations; graphical representation, are taken up in this course. Text, Hawkes, Luby, and Touton's *First Course in Algebra*. Prerequisite: Algebra I.

6.—ALGEBRA III. First year, spring term. Class work, four hours. Four credits. Required in the course in mechanic arts.

The subjects considered in this course are: involution, evolution, the theory of exponents, radicals, quadratic equations, with applications to practical problems. Text, Hawkes, Luby, and Touton's *First Course in Algebra*. Prerequisite: Algebra II.

7.—ALGEBRA IV. Third year, fall term. Class work, four hours. Four credits. Required in the course in mechanic arts.

This course includes a rapid review of factoring, fractions, linear equations and systems, roots, radicals and exponents, quadratic forms and systems with graphical work and theory of quadratics, ratio, proportion, and variation, the progressions, and the binomial theorem for positive integral exponents. Text, Hawkes, Luby, and Touton's *Second Course in Algebra*.

8.—APPLIED GEOMETRY. First year, spring term. Class work, four hours. Four credits. Required in the courses in agriculture and mechanic arts.

The course includes simple problems in geometrical construction; illustration, rather than proof, of important geometrical theorems; computation of areas and volumes, with especial emphasis upon the problems arising in buildings and constructions on the farm. The whole will consist of a simple and practical course in mensuration.

9.—PLANE GEOMETRY I. Second year, fall term. Class work, four hours. Four credits. Required in the course in mechanic arts.

Books I and II of Wentworth and Smith's *Plane and Solid Geometry* are studied in this course. Prerequisite: Algebra III.

10.—PLANE GEOMETRY II. Second year, winter term. Class work, four hours. Four credits. Required in the course in mechanic arts.

This course includes a study of books III, IV, and V of Wentworth and Smith's *Plane and Solid Geometry*. Prerequisite: Plane Geometry I.

11.—SOLID GEOMETRY. Second year, spring term. Class work, four hours. Four credits. Required in the course in mechanic arts.

Books VI, VII, and VIII of Wentworth and Smith's *Plane and Solid Geometry* are studied in this course. Prerequisite: Plane Geometry II.

12.—APPLIED MATHEMATICS. Third year, winter term. Class work, four hours. Four credits. Required in the course in mechanic arts.

This course embraces such subjects as the use of vernier and micrometer calipers and the slide rule; work and power; levers and beams; specific gravity; the use of squared and logarithmic paper; logarithms and the elements of trigonometry; problems in heat and electricity. Text, Cobb's *Applied Mathematics*.

## PHYSICAL EDUCATION

### MEN'S DEPARTMENT

#### 1-3.—PHYSICAL TRAINING I, II, AND III.

Six health talks. Elementary free-hand calisthenics; elementary light hand apparatus, including wands, dumb-bells, etc.; elementary heavy apparatus work, and games, are taken up. All work is graded in progressive order for each term. Swimming is taught in the spring term. A physical examination is made of each entering student.

### WOMEN'S DEPARTMENT

#### 1-3.—PHYSICAL TRAINING I, II, AND III. Offered in the first year.

This is an introductory course, including corrective exercises, light apparatus work, folk dancing, games, swimming. A physical examination is made of each entering student.

#### 4-6.—PHYSICAL TRAINING IV, V, AND VI. Offered in the second year.

A continuation of courses I, II, and III, taking up fancy steps, Swedish gymnastics, games, and swimming.

7.—PHYSIOLOGY AND HYGIENE. First year, fall term. Class work, four hours. Four credits.

This course includes study of the anatomical structure and physiological functions of the human body. It includes a careful consideration of such factors in the maintenance of health as fresh air, diet, sleep, bathing, exercise, etc.

## PHYSICS

1.—PHYSICS A-I. Third year, fall term. Class work, three hours; laboratory, two hours. Four credits. Required of all students in the course in agriculture.

The fundamental laws of mechanics and sound are presented in this course. The application of these principles to agriculture is especially emphasized. Laboratory work is conducted, based upon principles discussed in class and outlined in such a manner as to give students special drill in exact measurements. Text, Carhart and Chute's *Physics*. Prerequisite: Algebra III.

2.—PHYSICS A-II. Third year, winter term. Class work, three hours; laboratory, two hours. Four credits. Required of all students in the course in agriculture.

This is a continuation of work given in Physics A-I. A study is made of the units used in measuring electrical energy, of the principles involved in current distribution, and of the applications now being made of electricity on the farm. Laboratory work is arranged to give students practice in working with electrical instruments and appliances. Text, Carhart and Chute's *Physics*. Prerequisite: Physics A-I.

3.—PHYSICS A-III. Third year, spring term. Class work, three hours; laboratory, two hours. Four credits. Required of all students in the course in agriculture.

This is a continuation of Physics A-II, and involves a study of light and heat as a form of radiant energy involved in plant growth, weather conditions, and general phenomena. The laboratory work consists of thermometer tests, humidity measurements, calorimetry work, and light measurements. Text, Carhart and Chute's *Physics*. Prerequisite: Physics A-II.

4.—PHYSICS H-I. Second year, fall term. Class work, three hours; laboratory, two hours. Four credits. Required of all students in the course in home economics.

The work given in this course has a direct bearing on the principles of mechanics and sound as they apply to the home. The laboratory work is especially adapted to this phase of the work. Text, Carhart and Chute's *Physics*. Prerequisite: Algebra III.

5.—PHYSICS H-II. Second year, winter term. Class work, three hours; laboratory, two hours. Four credits. Required of all students in the course in home economics.

This course is a continuation of Physics H-I. The fundamental principles and laws of electricity are presented in this course, with special applications of the use of electricity in the home. Laboratory work is based on the study of simple electrical appliances used in the home. Text, Carhart and Chute's *Physics*. Prerequisite: Physics H-I.

6.—PHYSICS H-III. Second year, spring term. Class work, three hours; laboratory, two hours. Four credits. Required of all students in the course in home economics.

This course is a continuation of Physics H-II and includes a study of the principles of heat and light, special work being done in illumination and ventilation of the home. The laboratory work is based on methods of measuring heat, testing thermometers, and testing light sources. Text, Carhart and Chute's *Physics*. Prerequisite: Physics H-II.

7.—PHYSICS M-I. Second year, fall term. Class work, three hours; laboratory, two hours. Four credits. Required of all students in the course in mechanic arts.

Mechanics and Sound: This course provides the fundamental laws of mechanics and sound as adapted to work in mechanic arts, and special emphasis is placed upon a thorough knowledge of the units used and of the laws underlying machine principles. Laboratory work is arranged to give the students an opportunity to use some instruments of the better grade for making measurements and to test some of the physical properties of matter. Text, Carhart and Chute's *Physics*. Prerequisite: Algebra III.

8.—PHYSICS M-II. Second year, winter term. Class work, three hours; laboratory, two hours. Four credits. Required of all students in the course in mechanic arts.

Electricity: This course is a continuation of Physics M-I. The methods of producing electromotive force and of transferring, transforming, and measuring electrical energy are presented in this course. Laboratory work gives students an opportunity to use instruments and electrical apparatus in measuring and testing the effects of current. Text, Carhart and Chute's *Physics*. Prerequisite: Physics M-I.

9.—PHYSICS M-III. Second year, spring term. Class work, three hours; laboratory, two hours. Four credits. Required of all students in the course in mechanic arts.

Heat and Light: This course is a continuation of Physics M-II. A thorough study is made of heat and light as fundamental in the work of a mechanic, especially with respect to its application in heating, lighting and ventilation. The laboratory work gives students opportunity to use light as an accurate method of measurement, and to test materials with respect to heat conductivity. Text, Carhart and Chute's *Physics*. Prerequisite: Physics M-II.

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## Mechanic Arts Courses

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### DRAWING

1.—FREE-HAND DRAWING. First year, fall term. Laboratory, six hours. Three credits.

This course includes: exercises in drawing simple figures illustrating the effects of geometrical arrangement, radiation, repetition, symmetry, proportion, harmony, and contrast; exercises in drawing conventional plant ornaments; and free-hand lettering.

2.—OBJECT DRAWING. First year, winter term. Laboratory, six hours. Three credits.

Drawing from geometric solids and simple objects. Shading from the object.

3.—GEOMETRICAL DRAWING. First year, spring term. Laboratory, six hours. Three credits.

Construction of perpendiculars, parallels, angles, polygons, tangent connections, etc. Construction of the ovoid, oval, spiral, and ellipse. The use of the T-square, drawing boards, and India ink. Simple working drawings. Lettering.

4.—SHOP DRAWING I. Second year, fall term. One hour of lectures and recitations and four hours of drafting-room practice a week. Three credits.

A study of the fundamental principles of lettering, and the use of drawing instruments. Orthographic projection in its relation to working drawings. Simple exercises leading up to the study of working drawings in the succeeding terms. Prerequisite: Geometrical Drawing. Geometry I must accompany or precede this course.

5.—SHOP DRAWING II. Second year, winter term. One hour of lectures and recitations and four hours of drafting-room practice a week. Three credits.

A continuation of the preceding course, with more difficult exercises. In the latter part of the term free-hand sketches are made of simple machine parts, and working drawings are made from these sketches. Practice is given in making blue-prints. Prerequisites: Shop Drawing I and Geometry I.

6.—SHOP DRAWING III. Second year, spring term. One hour of lectures and recitations and four hours of drafting-room practice a week. Three credits.

Further practice in making working drawings of machine parts. Some attention is given to isometric and cabinet projections and to the development of patterns for sheet-metal work. Prerequisites: Shop Drawing II and Geometry II.

7.—COLOR AND DESIGN I AND II. Second year, fall and winter terms, respectively. Laboratory, six hours. Three credits each term.

This course consists of a study, by means of water-color exercises, of color and shade values and their effects in designs, fabrics, dresses, wall paper, and decorations of all kinds.

8.—FARM BUILDINGS. Third year, winter term. Laboratory, six hours. Three credits.

Study of arrangement and construction of farm buildings. Drawing of plans, elevations, sections and details of a general-purpose barn.

9.—HOME DECORATION. First year, spring term. Laboratory, eight hours. Four credits.

Study of design and color and their application to the home, its furniture, carpets and rugs, wall decorations and pictures.

## SHOP WORK

1.—FARM CARPENTRY. First year, winter term. Class work, one hour; shop work, four hours. Three credits.

This is a course of exercises in joinery that are so graded as to give the student the principles of general carpenter work, and training in the proper use of tools and in the reading of drawings and blue-prints. Some work is given to bring out the principles of framing and building operations, and practice in the use of paints and varnishes as protective coverings for woodwork.

2.—WOODWORK I. First year, fall term. Lectures, one hour; shop work, six hours. Four credits.

This course consists of a graded set of problems in joinery, the principles of which are used in the latter portion of the course in the making of a few simple pieces of cabinet work, together with practice in the use of stains, varnishes, rubbing and polishing of the articles made.

3.—ELEMENTARY FOUNDRY. First year, winter term. Lectures, one hour; shop work, six hours. Four credits.

This course consists of bench and floor molding with a great variety of patterns, along with which the student gets experience with different kinds of sand and facings; also, open sand work, sweep molds, and in-

struction in machine molding, core making, setting of cores, gates and risers, and different methods of venting, etc. The lectures consist of practical talks on the materials used in the foundry, the selection of sand, methods of venting, drying and handling of molds, cores, etc., for various classes of work. Also discussions on the handling of the cupola and the grading and mixing of the irons suitable for different classes of work. Special emphasis in all cases is laid upon the practical side of the work.

4.—FARM BLACKSMITHING. First year, spring term. Class work, one hour; shop work, four hours. Three credits.

This course consists of exercises in general forging operations, such as drawing, upsetting, welding, binding, twisting, hot and cold punching, and instruction in the use of fuel and fire, and the selection and care of tools. The course is such as will be of practical use to the man on the farm.

5.—ELEMENTARY BLACKSMITHING I. First year, spring term. Lecture, one hour; shop work, four hours. Three credits.

This consists of a very practical course in the forging operations, such as drawing, upsetting, welding, bending, twisting, punching, etc., together with instruction in the proper use and care of the fire, tools, etc., and in the handling of metals in the forge.



**Trade Practice in Mechanic Arts Course.**

(SCHOOL OF AGRICULTURE.)

*Trade Practice in Blacksmithing*

**FIRST YEAR**

FALL

WINTER

SPRING

Machine Shop I-S  
3 (0-6)

**SECOND YEAR**

Blacksmithing II-S  
3 (1-4)  
Gas and Oil Engines I  
3 (1-4)

Blacksmithing III-S  
3 (0-6)  
Strength of Materials I  
3 (3-0)

Blacksmithing IV-S  
3 (0-6)  
Strength of Materials II  
3 (3-0)

**THIRD YEAR\***

Blacksmithing V-S  
6 (0-12)  
Electricity I-S  
3 (2-2)  
Elements of Mechanism  
3 (3-0)

Blacksmithing VI-S  
6 (1-10)  
Machine Shop II-S  
3 (0-6)  
Steam Engines and Boilers I  
3 (1-4)

Blacksmithing VII-S  
3 (2-12)  
Concrete Construction I  
3 (1-4)  
Elective  
3 (-)

*Trade Practice in Carpentry*

**FIRST YEAR**

FALL

WINTER

SPRING

Woodturning  
3 (0-6)

**SECOND YEAR**

Bench Work  
3 (1-4)  
Gas and Oil Engines I  
3 (1-4)

Form Const. and Framing  
3 (1-4)  
Strength of Materials I  
3 (3-0)

Inside Finishing  
3 (1-4)  
Strength of Materials II  
3 (3-0)

**THIRD YEAR\***

Building Construction I  
6 (2-8)  
Shop Drawing IV  
3 (0-6)  
Electricity I-S  
3 (2-2)

Building Details  
9 (2-14)  
Estimating  
3 (0-6)

Building Construction II  
8 (2-12)  
Concrete Construction I  
3 (1-4)  
Elective  
3 (-)

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\* No third-year trade practice work will be offered in any course during the college year 1914-1915.

*Trade Practice in Cement and Concrete Construction*

## FIRST YEAR

FALL

WINTER

SPRING

Concrete Construction I  
3 (1-4)

## SECOND YEAR

Cement and Aggregate Tests  
3 (0-6)Strength of Materials I  
3 (3-0)Strength of Materials II  
3 (3-0)Cements and Aggregates  
3 (3-0)Form Const. and Framing  
3 (1-4)Concrete Construction II  
3 (0-6)

## THIRD YEAR

Electricity I-S  
3 (2-2)Machine Shop I-S  
3 (0-6)Carpentry  
3 (0-6)Structural Drawing  
3 (0-6)Steam Engines and Boilers I  
3 (1-4)Gas and Oil Engines I  
3 (1-4)Plain Concrete Design  
3 (0-6)Concrete Construction III  
3 (1-4)Forms and Centering  
3 (1-4)Structural Materials Tests  
3 (0-6)Reinforced Concrete Design  
3 (0-6)Concrete Construction IV  
3 (1-4)*Trade Practice in Gas Engines*

## FIRST YEAR

FALL

WINTER

SPRING

Gas Engines I  
3 (1-4)

## SECOND YEAR

Steam Engines and Boilers I  
3 (1-4)Gas Engines III  
3 (1-4)Gas Engines IV  
3 (1-4)Gas Engines II  
3 (1-4)Machine Shop I-S  
3 (0-6)Machine Shop II-S  
3 (0-6)

## THIRD YEAR\*

Pipe Fitting  
3 (0-6)Gas Engines V  
3 (0-6)Gas Engines VI  
3 (0-6)Concrete  
3 (0-6)Electricity II-S  
6 (3-6)Electricity III-S  
6 (3-6)Traction Engines I  
3 (0-6)Strength of Materials I  
3 (3-0)Strength of Materials II  
3 (3-0)Elements of Mechanism  
3 (3-0)

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\* No third-year trade practice work will be offered in any course during the college year 1914-1915.

*Trade Practice in Steam Engines and Boilers*

## FIRST YEAR

FALL

WINTER

SPRING

Steam Engines and Boilers I  
3 (1-4)

## SECOND YEAR

Steam Engines and Boilers II 3 (1-4)	Steam Engines and Boilers III 3 (1-4)	Steam Engines and Boilers IV 3 (1-4)
Gas and Oil Engines I 3 (1-4)	Machine Shop I-S 3 (1-4)	Machine Shop II-S 3 (1-4)

## THIRD YEAR\*

Elements of Mechanism 3 (3-0)	Steam Engines and Boilers V 3 (0-6)	Steam Engines and Boilers VI 3 (0-6)
Traction Engines I 3 (0-6)	Electricity II-S 6 (3-6)	Electricity III-S 6 (3-6)
Pipe Fitting 3 (0-6)	Strength of Materials I 3 (3-0)	Strength of Materials II 3 (3-0)
Concrete 3 (0-6)		

*Trade Practice in Traction Engines*

## FIRST YEAR

FALL

WINTER

SPRING

Traction Engines I  
3 (1-4)

## SECOND YEAR

Steam Engines and Boilers I 3 (1-4)	Traction Engines II 3 (1-4)	Traction Engines III 3 (1-4)
Gas and Oil Engines I 3 (1-4)	Machine Shop I-S 3 (1-4)	Machine Shop II-S 3 (1-4)

## THIRD YEAR\*

Elements of Mechanism 3 (3-0)	Traction Engines V 3 (0-6)	Traction Engines VI 3 (0-6)
Traction Engines IV 3 (0-6)	Electricity II-S 6 (3-6)	Electricity III-S 6 (3-6)
Concrete 3 (0-6)	Strength of Materials I 3 (3-0)	Strength of Materials II 3 (3-0)
Pipe Fitting 3 (0-6)		

\* No third-year trade practice work will be offered in any course during the college year 1914-1915.

## COURSES IN BLACKSMITHING.

1.—BLACKSMITHING I-S. First year, fall or spring term. Class work, one hour; shop work, four hours. Three credits.

The course includes general forging operations, such as drawing, up-setting, welding, twisting, punching, etc., together with instructions in the proper use and care of fire, tools, and forges.

2.—BLACKSMITHING II-S. Second year, fall term. Class work, one hour; laboratory, four hours. Three credits. Prerequisites: Woodwork I, Foundry, and Blacksmithing I-S.

The history and manufacture of tool steel, its relation to the industries, and the proper methods of selecting and working it in the shop are studied.

The laboratory work consists of the making of such tools as punches, chisels, drills, scrapers, hammers, and various other tools that are used in the trades.

3.—BLACKSMITHING III-S. Second year, winter term. Laboratory, six hours. Three credits. Prerequisite: Blacksmithing II-S.

This is a practical course in the various forging operations, with practice both as blacksmith and helper, and includes the planning and laying out of work with special provisions for duplicate parts; forging and forming tools are made as nature of work requires. Lectures are given so that the principles underlying the different operations are thoroughly understood.

4.—BLACKSMITHING IV-S. Second year, spring term. Laboratory, six hours. Three credits. Prerequisite: Blacksmithing III-S.

This course includes: the theory of hardening, tempering and annealing, case- and pack-hardening; a study of the nature of the different grades of carbon tool steels; tool forging, including the proper manipulation of the various lathe, planes and shaper tools; forging and heat treatment of special and high-speed steels. Instruction is by lectures and demonstrations.

5.—BLACKSMITHING V-S. Third year, fall term. Laboratory, twelve hours. Six credits. Prerequisite: Blacksmithing IV-S.

General shop work is here given, in which emphasis is laid on the quantity as well as the quality of the work, the idea being to give the student a knowledge of the amount of time required to do certain work. The work is varied as much as possible so that the knowledge acquired will be as complete as possible.

6.—BLACKSMITHING VI-S. Third year, winter term. Class work, one hour; laboratory, ten hours. Six credits. Prerequisite: Blacksmithing V-S.

On the basis of the knowledge acquired during the previous terms, the student is required to make estimates on job work, direct workmen in the various lines of shop production, and lay out plans for general repair work.

The idea is to give the student the knowledge and experience that will enable him to plan and manage a shop to the best advantage.

7.—BLACKSMITHING VII-S. Third year, spring term. Class work, two hours; laboratory, twelve hours. Eight credits. Prerequisite: Blacksmithing VI-S.

Regular blacksmithing and machine-shop practice is given on work such as is found in the regular custom shop, in order to develop accuracy and speed. The student at all times works under the critical eye of the instructor so as to correct any fault in the work.

Visits are made to commercial shops, and written reports and discussions are required on the methods of getting out work, pay systems, cost systems, buying and selling material, methods of handling men and customers, and the general considerations to be considered in conducting a business.

## COURSES IN CARPENTRY

1.—WOOD TURNING. First year, spring term. Laboratory, six hours. Three credits. Prerequisites: Woodwork, and Foundry.

Exercises in turning cylinders, cones, beads, convex and concave turning, and exercises that will involve the use of all the different turning tools, and turning between centers, on the faceplate and with hollow chucks are here included. Some of the exercises are: tool handles, dumbbells, rolling-pins, napkin rings, table legs, porch posts, balusters, built-up and solid newel posts, columns, and rosettes.

2.—BENCH WORK. Second year, fall term. Class work, one hour; laboratory, four hours. Three credits. Prerequisite: Wood Turning.

Hand work with the rabbet, router, beading and matching planes, and with dado, plow, and fillister in making of window sashes and frames, doors and frames, grooved flooring, door jambs, molding, etc. Along with the class work, lectures are given on the manufacture, use and care of the different varieties of lumber, grading rules, quarter-sawing, testing of lumber, piling to prevent warping, seasoning, kiln-dried lumber, steaming, and preserving wood, etc.

3.—FORM CONSTRUCTION AND FRAMING. Second year, winter term. Class work, one hour; laboratory, four hours. Three credits. Prerequisite: Bench Work. (For students in carpentry.)

The fundamental factors to be taken into consideration in the construction of buildings, as the building site, laying out and squaring foundation, excavating, types of foundations, form building for concrete, anchoring, placing of the sills, joists, bridging, studding, bracing, rafter cutting and fitting, are studied in this course.

The laboratory work consists of exercises along the lines given above.

4.—INSIDE FINISHING. Second year, spring term. Class work, one hour; laboratory, four hours. Three credits. Prerequisite: Form Construction and Framing.

The course includes a combination of machine and hand work where the material is worked up on the machines and then fitted by hand. Some of the work consists of making plain and fancy casings, plate rails, picture molding, picture frames, and in making simple pieces of furniture which are stained, varnished or otherwise finished.

Lectures are given along with the work on the protective coatings for woods, and written reports and discussions will be required. A study will also be made of the different kinds of woodworking machinery, from manufacturers' catalogues and from machines, with instructions as to their proper care and use.

5.—BUILDING CONSTRUCTION I. Third year, fall term. Class work, two hours; laboratory, eight hours. Six credits. Prerequisite: Inside Finishing.

A study of framework of buildings, partitions, rafters and methods of cutting, the use of the steel square, different types of trusses in common use, roofs and roofing, laying of sheeting, shingling, lathing; these are the subjects treated in this course.

In so far as it is practical, work will be given on buildings in the actual process of construction, and written reports and discussions will be required.

6.—BUILDING DETAILS. Third year, winter term. Class work, two hours; laboratory, fourteen hours. Nine credits. Prerequisite: Building Construction I.

This work includes a study of the different varieties of stairs, porches, siding, building papers, cornices, chimneys, furnaces, and ventilating systems, with written reports and discussions, from catalogues, books, and plans.

The laboratory work consists of building upon a small scale the structure drawn in the fall term.

7.—ESTIMATING. Third year, winter term. Laboratory, six hours. Three credits. Prerequisite: Shop Drawing IV.

Building plans and specifications are studied, a complete detailed list of all material required is made out, and the cost of such material is estimated from architects' plans and specifications.

8.—BUILDING CONSTRUCTION II. Third year, spring term. Class work, two hours; laboratory, twelve hours. Eight credits. Prerequisites: Shop Drawing IV, and Building Details.

This course embraces a study of building plans and specifications in order to learn to correctly interpret them.

The laboratory work consists of practical building work, and so far as it is possible the work will be on buildings in the actual process of construction, and written reports and discussions are required. A study is also made of commercial shops, of pay systems, cost systems, buying and selling material, methods of handling men and customers, and the best methods used by successful men in conducting a business enterprise.

9.—SHOP DRAWING IV. Third year, fall term. Laboratory, six hours. Three credits. Prerequisite: Shop Drawing III.

Plans and specifications for a complete building are drawn up, with a detailed list of all material used, and the cost is estimated from the plans so prepared.

10.—CARPENTRY. Third year, spring term. Laboratory, six hours. Three credits. Prerequisite: Form Construction and Framing.

Wood turning, carving, pattern making, and the making of molds and forms for ornamental concrete castings are the subjects taught in the course.

### COURSES IN CEMENT AND CONCRETE CONSTRUCTION

1.—CONCRETE CONSTRUCTION I. First year, spring term. Class work, one hour; laboratory, four hours. Three credits. Prerequisite: Woodwork I.

This course gives elementary instruction in the selection of materials and proper proportions for different kinds of concrete construction, and the essential principles of forming for, and of mixing and placing concrete, are taught with special reference to machine and building foundations, sidewalks, and floors.

The laboratory work consists of practice in the construction of such items as mentioned above.

2.—CEMENT AND AGGREGATE TESTS. Second year, fall term. Laboratory, six hours. Three credits. Prerequisite: Cement and Aggregates, or may be taken simultaneously.

Standard tests for fineness, specific gravity, soundness and strength of cement, for voids, uniformity coefficient and cleanness of sand and stone, and the effect of variation of these properties on the strength of mortars and concretes are the subjects taught here.

3.—CEMENTS AND AGGREGATES. Second year, fall term. Class work, three hours. Three credits. Prerequisite: Concrete Construction I.

The properties and tests of cements and of concrete aggregates, and the proportions and quantities for different concretes, and also the properties of concretes with different constituents are here dealt with.

4.—STRENGTH OF MATERIALS I. Second year, winter term. Class work, three hours. Three credits. Prerequisites: Physics M-I, Plane Geometry II, taken simultaneously.

The reactions, bending moments, shears and stresses in simple structures are determined.

5.—FORM CONSTRUCTION AND FRAMING. Second year, winter term. Class work, one hour; laboratory, four hours. Three credits. Prerequisite: Woodwork I.

The fundamental factors to be taken into consideration in the construction of buildings, as the building site, laying out and squaring foundation, excavating, types of foundations, form building for concrete, anchoring, placing of the sills, joists, bridging, studding, bracing, rafter cutting and fitting, are studied here.

The laboratory work consists of exercises along the lines given above.

6.—STRENGTH OF MATERIALS II. Second year, spring term. Class work, three hours. Three credits. Prerequisite: Strength of Materials I. The course embraces a study of the behavior of wood, steel and concrete when under stress, with the principles of design of structural elements, especially of concrete, wood, and steel.

7.—CONCRETE CONSTRUCTION II. Second year, spring term. Laboratory, six hours. Three credits. Prerequisite: Strength of Materials II. Field work is given in practical reinforced concrete construction, with lectures on field methods of bending steel, of placing it and securing it in place, and of mixing and placing, with special reference to building and bridge construction.

8.—STRUCTURAL DRAWING. Third year, fall term. Laboratory, six hours. Three credits. Prerequisite: Shop Drawing III. This course is planned to give the student facility in reading and interpreting plans of buildings and other structures.

9.—PLAIN CONCRETE DESIGN. Third year, fall term. Laboratory, six hours. Three credits. Prerequisites: Structural Drawing, and Structural Materials Tests, taken simultaneously.

Plain concrete structural elements, such as foundations and retaining walls, are designed.

10.—STRUCTURAL MATERIALS TESTS. Third year, fall term. Laboratory, six hours. Three credits. Prerequisite: Concrete Construction II. Tension, compression, and bending tests are made on wood, steel, and concrete.

11.—CONCRETE CONSTRUCTION III. Third year, winter term. Class work, one hour; laboratory, four hours. Three credits. Prerequisite: Concrete Construction II.

Concrete machinery and concrete distributing systems used on large construction work are studied. Practice is had in the construction of plaster and stucco work and in the finishing of concrete surfaces.

12.—REINFORCED CONCRETE DESIGN. Third year, winter term. Laboratory work, six hours. Three credits. Prerequisite: Plain Concrete Design.

The course includes the design of simple reinforced concrete structures, with complete working drawings.

13.—FORMS AND CENTERING. Third year, spring term. Class work, one hour; laboratory, four hours. Three credits. Prerequisite: Reinforced Concrete Design.

Lectures are given on the design of forms and centering for concrete construction, with the preparation of working drawings in the drafting room for the structures designed in the preceding term, and other more complex structures.

14.—CONCRETE CONSTRUCTION IV. Third year, spring term. Class work, one hour; laboratory, four hours. Three credits. Prerequisites: Reinforced Concrete Design, and Concrete Construction III.

Costs of concrete work are estimated, and practice is given in the manufacture of concrete blocks and in ornamental casting.

15.—CONCRETE. Third year, fall term. Laboratory, six hours. Three credits. Prerequisite: Woodwork I.

Elementary instruction is given in the selection of materials and proper proportions for different kinds of concrete construction, and the essential principles of forming for, and of mixing and placing concrete, with special reference to machine and building foundations, sidewalks, and floors.

Laboratory work consists of practice in the construction of such items as mentioned above.

16.—ELEMENTS OF MECHANISM. Third year, fall term. Class work, three hours. Three credits. Prerequisites: Plane Geometry, Shop Drawing III, Strength of Materials I.

The course includes an analysis of the different machine elements, such as screws, pulleys, belting, cams and gears, with such computations as are necessary to enable the proper size of these elements to be selected for use under given conditions.

### COURSE IN ELECTRICITY

1.—ELECTRICITY I-S. Third year, fall term. Class work, two hours; laboratory, two hours. Three credits.

This course embraces a study of wiring materials and electrical machinery; line work; illumination; open and concealed wiring; wiring in conduit and metal molding; installation and operation of both direct- and alternating-current motors, generators, lamps, and heating appliances.

2.—ELECTRICITY II-S. Third year, winter term. Class work, three hours; laboratory, six hours. Six credits. Prerequisites: Physics I, II, and III.

The course comprises a study of wiring materials, wiring, and direct-current machinery; line work, open and concealed wiring, theory, installation and operation of direct-current generators, motors, lamps, storage batteries, and heating appliances.

3.—ELECTRICITY III-S. Third year, spring term. Class work, three hours; laboratory, six hours. Six credits. Prerequisite: Electricity II-S.

This is a continuation of Electricity II-S. Alternating-current apparatus, generators, motors, transformers, rectifiers, wiring in conduit and in metal molding are here studied.

### COURSES IN GAS ENGINES

1.—GAS ENGINES I. First year, spring term. Class work, one hour; laboratory, four hours. Three credits. Prerequisites: Foundry, and Blacksmithing I.

This course comprises a study of heat engines, principles of gas engines, gas-engine auxiliaries, two- and four-cycle frames, material used in construction, essential parts of an internal-combustion engine.

The laboratory work consists of a study of the different engines, batteries, different systems of ignition, cooling, operation and care, lubricators, lubricants, and adjustments.

2.—GAS ENGINES II. Second year, fall term. Class work, one hour; laboratory, four hours. Three credits. Prerequisite: Gas Engines I.

The work here given includes a study of ignition, cooling, and gas-engine accessories, of the elements of gas producers, of the assembling of gas engines.

The laboratory work teaches the operation of engines of all types, the dismounting, reassembling, and adjusting valves, gears, and ignition devices.

3.—GAS ENGINES III. Second year, winter term. Class work, one hour; laboratory, four hours. Three credits. Prerequisite: Gas engines II.

Fuels, both liquid and gaseous are studied. Heat determinations of different fuels are made. A study is made of indicators, planimeters, and brakes, of power determinations, and engine testing, of carburetion and carburetors.

The laboratory work includes the running of engines with different fuels, and different carburetors; practice with indicators and planimeters; brake tests for fuel economy, and mechanical efficiency.



4.—GAS ENGINES IV. Second year, spring term. Class work, one hour; laboratory, four hours. Three credits. Prerequisite: Gas Engines III.

The construction, erection, design, and operation of complete gas-engine plants for mills, factories, shops, lighting, water supply, irrigation, and private use are studied in this course.

As laboratory work a gas producer is operated; fuels and lubricants are tested; general engine repair work is done.

5.—GAS ENGINES V. Third year, winter term. Laboratory, six hours. Three credits. Prerequisites: Machine Shop III, Gas Engines IV, Electricity II-S.

The work comprises the erecting, fitting, equipping, and adjusting of engines; the designing of valve gears, valves, and cams; the production of two plates; the preparation of bulletins to cover the laboratory work.

6.—GAS ENGINES VI. Third year, spring term. Laboratory, six hours. Three credits. Prerequisite: Gas Engines V.

Tests are made of the engines erected during Trade Practice V, for fuel, economy, boiler horsepower, indicated horsepower, mechanical efficiency, general behavior of the engine. Correct tabulation of all tests is a required part of the work.

7.—GAS AND OIL ENGINES I. Second or third year, fall, winter or spring term. Class work, one hour; laboratory, four hours. Three credits. Prerequisite: Blacksmithing I.

This course includes a study of the four-stroke cycle and two-stroke cycle gasoline engine; gas-engine fuels, mechanical details of gas engines, carburetors for gasoline and heavy-oil engines, ignition, cooling, and governing; selection and management of oil engines.

### COURSES IN MACHINE-SHOP WORK

1.—MACHINE SHOP I-S. First year, spring term. Laboratory, six hours. Three credits. Prerequisite: Foundry.

Practice is had in clipping, filing, scraping, drilling, shaper and planer work. Lathe work is given in cutting right and left threads, taper turning and threading.

2.—MACHINE SHOP II-S. Second year, spring term, and third year, winter term. Laboratory, six hours. Three credits. Prerequisites: Blacksmithing I, and Machine Shop I.

This embraces practical work in making repairs on machinery, such as babbitting and fitting bearings, aligning shafting and pulleys, lacing and fitting belts, and general repair work on engines and other machinery.

3.—PIPE FITTING. Third year, fall term. Laboratory, six hours. Three credits.

Practice work is given in the cutting and threading of all sizes of standard and extra heavy pipe up to 10 inch, in the use of fittings of various kinds, in the squaring up of flanges, in the cutting, fitting and testing of gaskets for various pressures, in the grinding, packing and testing of valves.

### COURSES IN STEAM ENGINES AND BOILERS

1.—STEAM ENGINES AND BOILERS I. First year, fall, winter or spring term. Class work, one hour; laboratory, four hours. Three credits. Prerequisite: Blacksmithing.

The principal parts of a steam power plant are considered, including fire-tube and water-tube boilers, boiler auxiliaries, piping for boilers, feed-water heaters, firing; fundamental details of steam engines; selection, operation and management of steam engines and boilers.

2.—STEAM ENGINES AND BOILERS II. Second year, fall term. Class work, one hour; laboratory, four hours. Three credits. Prerequisite: Steam Engines and Boilers I.

This is a continuation of the work given in the previous term, including a study of fuels and combustion; also pumps and injectors.

3.—STEAM ENGINES AND BOILERS III. Second year, winter term. Class work, one hour; laboratory, four hours. Three credits. Prerequisite: Steam Engines and Boilers II.

The various steam-engine valve gears and governors are studied, adjusted and tested. Some attention is also given to indicators and planimeters.

4.—STEAM ENGINES AND BOILERS IV. Second year, spring term. Class work, one hour; laboratory, four hours. Three credits. Prerequisites: Steam Engines and Boilers III, and Machine Shop I-S.

The erection, lining up and repairing of steam engines is taken up. Some time is also given to steam turbines.

5.—STEAM ENGINES AND BOILERS V. Third year, winter term. Laboratory, six hours. Three credits. Prerequisites: Steam Engines and Boilers IV, Concrete Pipe Fitting, and Machine Shop II-S.

Engines, boilers, stokers, feed-water heaters, pumps and injectors are handled practically.

6.—STEAM ENGINES AND BOILERS VI. Third year, spring term. Laboratory, six hours. Three credits. Prerequisite: Steam Engines and Boilers V.

This course includes the practical handling of a steam-electric power plant, also of a heating plant. Some experience is also given in simple tests of engines and boilers.

### COURSES IN TRACTION ENGINES.

1.—TRACTION ENGINES I. First year, fall or spring term. Class work, one hour; laboratory, four hours. Three credits. Prerequisite: Blacksmithing.

The subjects studied in this course are: Fundamental parts of a traction engine; steam and gas traction engine details; differentials, gearing trains, and clutches.

2.—TRACTION ENGINES II. Second year, winter term. Class work, one hour; laboratory, four hours. Three credits. Prerequisites: Traction Engines I, Steam Engines and Boilers I, Gas and Oil Engines I.

Traction engine types and variations in detail for light and heavy fuels; radiators, cooling, ignition, lubrication, mountings; tractor wheels; steam and gas traction engine auxiliaries—these are the subjects studied here.

3.—TRACTION ENGINES III. Second year, spring term. Class work, one hour; laboratory, four hours. Three credits. Prerequisites: Traction Engines II, and Machine Shop I-S.

Steam and gas traction engines are operated, adjusted, and repaired.

4.—TRACTION ENGINES IV. Third year, fall term. Laboratory, six hours. Three credits. Prerequisites: Traction Engines III, and Machine Shop II-S.

Hitches and their value in plowing, side draft, handling of tractors on road and for belt work are here studied.

5.—TRACTION ENGINES V. Third year, winter term. Laboratory, six hours. Three credits. Prerequisite: Traction Engines IV.

The course includes adjustments, repairs, and overhauling of tractors; tests of tractors on belt work.

6.—TRACTION ENGINES VI. Third year, spring term. Laboratory, six hours. Three credits. Prerequisite: Traction Engines V.

Road work with steam and gas tractors; grading, plowing, discing, seeding and freighting are done. The cost of operation is tested.

## Home Economics Courses

### DOMESTIC ART

1.—SEWING I. Laboratory, four hours. Two credits.

This course includes practice in the fundamental stitches and their application to the following: bags, towels, darning, patching, button-holes, Christmas gifts, at the discretion of the teacher.

2.—SEWING II. Laboratory, four hours. Two credits.

The work includes machine problems, practice in flannel, the making of kimonos and cooking aprons.

3.—SEWING III. Laboratory, four hours. Two credits.

The course comprises pattern drafting and the making of corset covers and drawers.

4.—SEWING IV. Laboratory, four hours. Two credits.

The course comprises the drafting of patterns for undergarments, skirt, and waist, and the making of underskirts and nightgowns.

5.—SHIRT-WAIST SUIT. Laboratory, four hours. Two credits.

Making a shirt waist and a skirt and drafting patterns for them comprises the course. The materials used for the garments may be cotton or linen.

6.—DRESSMAKING. Laboratory, four hours. Two credits.

This course includes practice in the adaptation of patterns and the making of a simple cloth dress.

7.—TEXTILES. Lecture, two hours. Two credits.

The history and manufacture of textiles, the development of spinning and weaving, the classification and study of fibers, practical tests for adulteration, are taken up in the course.

8.—ART NEEDLEWORK. Laboratory, four hours. Two credits.

The course includes the following: stitches in crochet, knitting, cross-stitch, French embroidery, Roman cut work; their application to undergarments, waists, collars, and household articles.

9.—MILLINERY. Laboratory, four hours. Two credits.

The course includes practical and artistic principles; preparing various materials for trimmings; practice in making bows, rosettes, and other forms of hat decoration; making wire and buckram frames; the use of velvet, silk, and straw; renovating, and the use of old materials.

10.—COSTUME DESIGN. Laboratory, four hours. Two credits.

This course includes the study of design, color harmony, and practice in their direct application to designs for textiles, embroidery, and costumes; and the sketching of costumes in pencil and water color.

11.—ADVANCED DRESSMAKING. Laboratory, four hours. Two credits.  
This course presents the use of bought patterns and practice in cutting, fitting and finishing more elaborate dresses than those made up in preceding courses.

### DOMESTIC SCIENCE

1-3.—COOKERY I, II, AND III. Second year, fall, winter and spring terms, respectively. Laboratory, four hours. Two credits each term.

Fundamental principles and processes of cooking are taken up. The purpose is to familiarize the student with laboratory methods, to give fundamental knowledge of foods and their preparation, and to develop skill and efficiency in the handling of materials, utensils, stoves, and fuels.

4-6.—COOKERY IV, V, AND VI. Third year, fall, winter and spring terms, respectively. Laboratory, four hours. Two credits each term.

Advanced cooking, including the canning and preserving of fruits and vegetables, and the preparation and serving of meals, are the subjects taken up.

7.—FOOD PRODUCTION. Third year, spring term. Class work, three hours. Three credits.

This course is a study of food materials, their growth, the conditions under which they are matured and marketed, and the problems which relate to their storage and transportation.

8.—HOME SANITATION. First year, winter term. Class work, four hours. Four credits.

A study is made of location, surroundings, heating, lighting, ventilation and water supply of the house in their relation to the health of the family.

9.—HOME MANAGEMENT. First year, winter term. Class work, four hours. Four credits.

A study is made of standards of living, including the care of walls, doors, woodwork, and plumbing.

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VOCATIONAL GUIDANCE I AND II. Freshman year, fall and winter terms, respectively. One credit each term.

The purpose of this course is to give the students some insight into the vocations open to them, in order that they may have a sufficient knowledge for making a wise selection of a vocation. Both the social and economic possibilities of the different vocations are discussed.

## Division of Agriculture

WILLIAM M JARDINE, *Dean.*

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The teaching of a rational, practical system of agriculture is fundamental to industrial development in a State whose principal resources are derived from agricultural pursuits. This State has permanent prosperity in direct proportion to the producing capacity of her land. The unit of production is the acre, and the most successful farmer is necessarily the one who can produce, at minimum cost, a maximum quantity of the best quality of agricultural products to the acre.

In order to do this, it is necessary to know something of the soil, the conservation of its fertility and moisture, and its proper cultivation; the kinds of plants to grow and how to improve them; the selection, breeding and feeding of live stock; the maintenance of orchards, gardens, and attractive surroundings; farm buildings, and the equipment of the farm home with modern conveniences; the best methods of marketing the products of the farm; and, in addition to all this, the making of the farm home the center of influence for good citizenship and fellowship in the neighborhood.

A man may get many of these things through practical experience, and thus become an exponent of modern farming, but the cost entailed is usually unnecessarily great. The Agricultural College furnishes a means of acquiring a systematic and practical training in agriculture, which fits young men adequately for the farm, at a minimum of time and financial cost.

### EQUIPMENT.

The facilities for such training in this College are of the best. The College owns 748 acres of land, which is used for instruction and demonstration in the various courses in agriculture and allied branches. The campus, which comprises 160 acres, affords one of the best examples of ornamental tree planting and forestry in the State. Students working daily amid such surroundings can scarcely fail to gain an appreciation of and love for the beautiful. A tract of 320 acres, purchased with an appropriation made by the legislature of 1909, is devoted to the work in agronomy. For horticultural and forestry work, eighty acres are used; for dairy work, about seventy acres; and for animal husbandry purposes, 140 acres. The herds and flocks contain all the important breeds of dairy and beef cattle, hogs, horses, and sheep, among which are included the world's champion steers of a recent international

stock show at Chicago, and many animals that have won championships at local and state fairs in the past five years. With this class of stock available for the work in judging, the student is supplied with types of the best breeds, and becomes familiar with these types by actual handling of the stock.

The College has one of the best-equipped schools of veterinary medicine in the West. It is rated in class "A" by the United States Department of Agriculture, which rating places it among the best in the United States and Canada. In addition to giving the student the best possible technical training in veterinary medicine, the course is designed to give the broad culture necessary for men who are to take their place in society and public affairs. Professional men, such as veterinarians, are placed in a more or less public relation to the community they serve. They must have a broad groundwork in cultural and ethical training, which will win them the confidence and respect of their communities. Success is measured in something more than dollars and cents, and the man whose view of life is no broader than his profession adds but little to the world and its happiness. The training given by the College in veterinary science, as in all its courses in agriculture, seeks to emphasize the value of the man as a man, as much as his value as a specialist in agriculture.

#### COURSES OF STUDY

The various needs of the student are met by offering in the division of agriculture the following courses:

- A four-year course in agriculture.
- A four-year course in veterinary medicine.
- A three-year secondary course in agriculture.
- A two-year short winter course in agriculture.
- A two-year short winter course in dairying.
- A one-year short winter course in dairy manufactures.
- A short course in testing dairy products.

#### DEGREES AND CERTIFICATES.

The four-year course in agriculture leads to the degree of bachelor of science in agriculture. The four-year course in veterinary medicine leads to the degree of doctor of veterinary medicine. A certificate in agriculture is granted to a student completing the three-year course. A short-course certificate is granted to a student completing either of the two-year short courses in agriculture.

The four-year course in agriculture is designed to meet the needs primarily of the students who expect to return to the farm. However, the student who completes any of the courses offered will have had sufficient training to enable him to enter some one of the many lines of agricultural industry as a specialist. The demand for men thus trained is constantly

increasing, and such positions offer attractive opportunities for men who by nature and training are adapted to the work. The United States Department of Agriculture, the state colleges and departments of agriculture, high schools, private institutions of secondary and college rank, and a great variety of commercial interests, are constantly demanding men trained in agriculture.

The young man who expects to make farming his life work can start with no better asset than the thorough training in practical and scientific agriculture afforded by the four-year course. The American farmer needs more of the skill that comes through the training of the hand, in order that he may better do the work of farming; but infinitely more, he needs the training of the mind in the fundamental truths that lie back of every operation in farming, in order that he may use the skill of the craftsman with reason and judgment. One may learn to plow a field with the greatest skill; the work may be a model of its kind. If, however, it is plowed with utter disregard of the moisture conditions which prevail, the result may be a failure. To understand the conditions which should determine when and how to plow is the work of the trained mind; the other is the work of the trained hand. The farmer and the teacher in farming must possess both kinds of training, and the courses of study have been revised with this fact in view, and have been so arranged that *the student begins his practical training in agriculture on the first day he enters College, and continues it throughout the course.*

#### THE COURSE IN AGRICULTURE.

Two hundred fourteen credits in addition to military drill are required for graduation, as follows:

	Credits.
Prescribed agriculture .....	55
Electives in agriculture required, with their prerequisites.....	35 to 40
Required in agriculture .....	90 to 95
Prescribed in nonagriculture .....	107
Electives in nonagriculture required .....	17 to 12
Required in nonagriculture .....	124 to 119
Total term hours for graduation .....	214 214

Only those students will be allowed to graduate who have had at least six months' practical experience in agriculture, approved by the Dean of the Division of Agriculture, and who have elected (including the prerequisites) twenty credits within a department of the Division of Agriculture. The prerequisites are to be other than those in the required work.

The student who completes the freshman and sophomore years will have had, in addition to the fundamental work in

chemistry, zoölogy, and botany, practical studies each term in farm crops, cattle, hogs, horses, sheep, dairying, poultry, horticulture, and farm mechanics. These two years give the student a general knowledge of the whole range of practical agriculture. One-third of the student's time is devoted to these subjects.

During the junior and senior years the student continues his studies of fundamental science, and learns to apply science to practical agriculture. He is led step by step to understand the scientific relation of every farming operation. There is so much agriculture to be taught that it becomes necessary for the student to choose in which of the general lines he will find that which best suits his needs or liking. This is made possible by numerous electives in soils, crops, farm machinery, animal husbandry, dairying, horticulture, milling, and poultry.

The foundation of all agricultural work is the soil and the crops grown upon it. Success in live stock or dairying depends, in a great measure, upon the ability of the soil to produce, with economy, sufficient crops of the right character. Success in grain farming depends wholly on the productiveness of the soil and the selection of the crops and of methods of culture adapted to the region under cultivation.

#### THE COURSE IN VETERINARY MEDICINE

Veterinary medicine has made remarkable advances within recent years, and is taking its place alongside human medicine as a science. In truth, medical science and veterinary science are but specialized branches of the same science, and must be developed together. The modern veterinarian takes his place in the community as a professional man of education and culture. With the general improvement of the live stock on the farms, and with their advance in value, there is constant increase in the demand for skilled physicians to care for them.

The veterinarian, while primarily trained to conserve the health of farm animals, has a yet larger service to render in preventing diseases common to both man and beast from being communicated from domestic animals to man. Moreover, he must see that the animals slaughtered for meat are healthy and that the products are handled under such conditions as render them suitable for human food.

The public is now demanding that milk and other food products be free from contamination, and that they be incapable of transmitting dangerous diseases, like tuberculosis, typhoid fever, scarlet fever, and diphtheria. There is ample work for all of the thoroughly competent veterinarians that the colleges of the country will train.

The course in veterinary medicine at the Agricultural College was established to give the young men of this State an opportunity to pursue these studies in an agricultural



environment, where the facilities offered by other branches of the College would be at their command. While the instruction in this course is largely technical, enough subjects of a general character are included to give a sound education and a broad outlook.

Better to fit the veterinarian to deal wisely with the live-stock problems which he has to meet, he is required to take the work in stock feeding, stock breeding, stock judging, pedigrees, milk inspection, vertebrate zoölogy, embryology, and agricultural economics, in addition to his purely professional work.

The diploma from this school is recognized by the United States Department of Agriculture, by the United States Civil Service Commission, by the American Veterinary Medical Association, and by the various examining boards of the several states and territories of America where it has been presented.

### THREE-YEAR COURSE IN AGRICULTURE

The purpose of the three-year course is to furnish practical, systematic training in agriculture to persons of mature judgment who are unable to meet the college entrance requirements. The work is given by the regular members of the College Faculty. This course, throughout, emphasizes the practical phases of agriculture. The necessity for a thorough understanding of the fundamental principles that form the foundation upon which agricultural practices are built is, however, not lost sight of, and as much of this phase of the work is given as the student's preparation will permit.

### Course in Agriculture

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

#### FRESHMAN

FALL	WINTER	SPRING
Chemistry I 4 (3-2)	Chemistry II 4 (2-4)	Chemistry III 4 (3-2)
English I 4 (4-0)	English II 4 (4-0)	College Rhetoric I 4 (4-0)
General Botany 5 (3-4)	Plant Anatomy 5 (3-4)	Plant Physiology I 4 (2-4)
Market Types and Classes of Stock 4 (1-6)	Breeding Types and Classes of Stock 4 (1-6)	Plant Propagation 4 (3-2)
		Dairy Judging 2 (0-4)
Military Drill	Military Drill	Military Drill

COURSE IN AGRICULTURE—*continued*

## SOPHOMORE

FALL	WINTER	SPRING
Qualitative Analysis 4 (2-4)	Elementary Organic Chemistry 4 (4-0)	Quantitative Analysis I 2 (2-0) <i>or</i>
Cereal Crop Production 5 (3-4)	Forage Crops 4 (3-2)	Agricultural Chemistry 2 (2-0)
General Zoölogy I 4 (2-4)	General Zoölogy II 4 (2-4)	Farm Mechanics 4 (2-4)
Anatomy 5 (0-10)	Library Methods 2 (1-2)	Embryology 4 (2-4)
	Animal Physiology 4 (4-0)	Principles of Feeding 4 (4-0)
		Elements of Dairying 4 (2-4)
Military Drill	Military Drill	Military Drill

## JUNIOR

Agricultural Chemistry 2 (2-0) <i>or</i>	American Government 4 (4-0)	General Entomology 4 (3-2)
Quantitative Analysis I 2 (0-4)	Soils 5 (3-4)	Soil Fertility 4 (3-2)
General Geology 4 (4-0)	Principles of Animal Breeding 4 (4-0) <i>or</i>	Elementary Journalism 2 (0-4)
General Bacteriology 4 (2-4)	Plant Breeding 4 (2-4)	
Farm Poultry Production 3 (2-2)		
Electives* 5 ( - )	Electives* 5 ( - )	Electives* 8 ( - )

## SENIOR

Economics 4 (4-0) <i>or</i>	Agricultural Economics 4 (4-0) <i>or</i>	Sociology 4 (4-0) <i>or</i>
Principles of Sociology 4 (4-0)	Rural Sociology 4 (4-0) <i>or</i>	Economics 4 (4-0)
College Rhetoric II 4 (4-0)	American History I 4 (4-0)	
	Farm Management 4 (3-2)	
Electives* 10 ( - )	Electives* 10 ( - )	Electives* 10 ( - )

*Agricultural Electives for Students in the Course  
in Agriculture*

## AGRONOMY

FALL	WINTER	SPRING
Advanced Soils 4 (2-4)	Principles of Agronomic Experimentation 4 (1-6)	Forage Crop Improvement 4 (1-6)
Advanced Farm Mechanics 4 (1-6)	Cereal Crop Improvement 4 (1-6)	Soil Survey 4 (2-4)
	Soil Research 4 (0-8)	Soil Research 4 (0-8)
	Farm Building and Equipment 4 (2-4)	Irrigation and Drainage 4 (2-4)

\* Students preparing to teach should take psychology and the educational electives, group 18 of the electives, for the course in general science.

*Electives for Students—continued*

## ANIMAL HUSBANDRY

FALL	WINTER	SPRING
History of Breeds and Pedigrees 4 (2-4)	Pork and Mutton Production 3 (3-0)	Live Stock Management II 2 (0-4)
Live Stock Management I 2 (0-4)	Meats 2 (1-2)	Advanced Judging I 2 (0-4)
Advanced Judging II 2 (0-4)		Beef Production 2 (2-0)
Breeding Pure-bred Live Stock 2 (2-0)		Horse Production 3 (3-0)
		Seminar 1 (1-0)

## DAIRY HUSBANDRY

Pure-bred Dairy Cattle 3 (2-2)	Milk Products and Herd Management 3 (3-0)	Dairy Inspection I 2 (1-2)
Butter-making and Creamery Management 5 (3-4)		Cheese and Ice Cream Making 4 (2-4)
		Dairy Buildings and Equipment 2 (2-0)
		Advanced Dairy Judging 1 (0-2)
		Dairy Seminar 2 (2-0)

## HORTICULTURE

Pomology I 2 (0-4)	Principles of Orchardng 3 (3-0)	Small Fruits 2 (2-0)
Kitchen Gardening 2 (2-0)	Spraying 3 (1-4)	Ornamental Gardening 2 (2-0)
Advanced Pomology 4 (3-2)		Orchard Management 4 (2-4)
		Market Gardening 3 (2-2)
		Landscape Gardening 3 (2-2)
		Landscape Plans and Materials 4 (2-4)
		Greenhouse Construction and Management 4 (4-0)

## MILLING INDUSTRY

Commercial Grain and Grain Inspection 4 (3-2)	Grain Products 4 (3-2)	Experimental Milling 2 (0-4)
Advanced Experimental Milling 4 (0-8)	Wheat and Flour Testing 4 (1-6)	Experimental Baking Tests 4 (0-8)
		Milling Practice 4 (0-8)

## POULTRY HUSBANDRY

Practice in Candling 1 (0-2)	Advanced Judging 2 (0-4)	Practice in Poultry Feeding 1 (0-11½) 4 weeks
Practice in Caponizing and Dressing 1 (0-2)	Poultry Management (Vet) 2 (2-0)	Practice in Incubation 1 (0-11½) 4 weeks
Breeds and Types 3 (1-4)		Practice in Brooding 1 (0-11½) 4 weeks

## FORESTRY

Silviculture 3 (2-2)	Farm Forestry 4 (3-2)
	Dendrology 2 (1-2)

## List of Electives for Agricultural Students, with Their Prerequisites.

<i>Subject.</i>	<i>Prerequisites.</i>
<b>AGRONOMY.</b>	
Forage Crop Improvement.....	Forage Crops, Principles of Breeding.
Principles of Agronomic Experimentation.....	Forage Crops, Soil Fertility, Forage Crop Improvement.
Advanced Grain Judging.....	Cereal Crop Production.
Cereal Crop Improvement.....	Forage Crops, Taxonomic Botany, Principles of Breeding.
Soil Survey .....	Soils.
Advanced Soils .....	Soils.
Soils Research I.....	Advanced Soils, Soil Bacteriology.
Soils Research II.....	Soils Research I.
Advanced Farm Mechanics.....	Farm Mechanics.
Farm Buildings and Equipment.....	Farm Mechanics.
Irrigation and Drainage.....	Farm Mechanics, Soil Fertility.
<b>ANIMAL HUSBANDRY.</b>	
History of Breeds and Pedigrees.....	Principles of Feeding.
Live Stock Management.....	Principles of Feeding.
Pork and Mutton Production.....	Principles of Feeding.
Live Stock Management II.....	Live Stock Management I.
Advanced Judging I.....	Market Types and Classes, Breeding Types and Classes, Principles of Feeding.
Advanced Judging II.....	Advanced Judging I.
Breeding Pure-Bred Live Stock.....	Advanced Judging I.
Meats .....	Principles of Feeding.
Beef Production .....	Principles of Feeding.
Horse Production .....	Principles of Feeding.
Animal Husbandry Seminar.....	History of Breeds and Breeding, Breeding Pure-Bred Live Stock.
Breeding Types I.....	Market Types and Classes.
Principles of Feeding.....	Elementary Organic Chemistry.
<b>BACTERIOLOGY.</b>	
Soil Microbiology .....	General Bacteriology.
Dairy Bacteriology .....	General Bacteriology.
Serum Threapy (Vets).....	Pathogenic Bacteriology I and II.
Bacteriology of Poultry Diseases and Poultry Products .....	General Bacteriology.
<b>BOTANY.</b>	
Plant Physiology II.....	Plant Physiology I.
Advanced Plant Breeding .....	Plant Breeding.
Economic Botany .....	Plant Morphology.
Plant Pathology II.....	Plant Pathology I.
Plant Pathology III.....	Plant Pathology II.
Seed Testing .....	General Botany.
<b>CHEMISTRY.</b>	
Quantitative Analysis II.....	Quantitative Analysis I.
Quantitative Analysis III.....	Quantitative Analysis II.
Quantitative Analysis IV.....	Quantitative Analysis III.
Chemistry D-I .....	Quantitative Analysis I.
Chemistry D-II .....	Chemistry D-I.
Principles of Animal Nutrition.....	Elementary Organic Chemistry.
Inorganic Chemistry I, II, III.....	Qualitative Analysis.
Organic Chemistry I, II, III.....	None.
Physiological Chemistry I, II, III.....	Elementary Organic Chemistry.
<b>DAIRY HUSBANDRY.</b>	
Dairy Inspection I.....	General Bacteriology, Chem. D-I and D-II.
Pure-Bred Dairy Cattle.....	None.
Butter-Making and Creamery Manag'm't.....	None.
Cheese and Ice Cream Making.....	Chem. D-I and D-II, Dairy Bacteriology.
Dairy Buildings and Equipment.....	None.
Advanced Dairy Judging.....	Dairy Judging.
Dairy Seminar .....	Elements of Dairying, Dairy Inspection I, Pure-Bred Dairy Cattle, Milk Production.
Dairy Inspection II.....	None.
Milk Production and Herd Management.....	Principles of Feeding.
Home Dairying .....	None.
<b>ECONOMICS.</b>	
Agricultural Economics .....	None.

*Electives for Students—continued*

<i>Subject.</i>	<i>Prerequisites.</i>
<b>EDUCATION.</b>	
Psychology .....	None.
History of Education .....	None.
Principles of Education .....	None.
Teaching Method .....	None.
Educational Psychology .....	None.
School Hygiene .....	None.
School Administration .....	None.
Practice Teaching .....	None.
Agricultural Education .....	None.
Rural Education .....	None.
Educational Seminar .....	None.
<b>ENGLISH LANGUAGE.</b>	
Argumentation and Debate.....	College Rhetoric I.
Bible English .....	College Rhetoric I.
English Practice .....	College Rhetoric I.
Farm and Home English.....	College Rhetoric I.
Business English .....	College Rhetoric I.
Applied English .....	College Rhetoric I.
Farm Advertising .....	College Rhetoric I.
Farm Stories .....	College Rhetoric I.
Farm Bulletins .....	College Rhetoric I.
Applications .....	College Rhetoric I.
<b>ENGLISH LITERATURE.</b>	
English Literature I.....	College Rhetoric I.
English Literature II.....	English Literature I.
Studies in Oratory.....	College Rhetoric I.
English Drama .....	College Rhetoric I.
The English Novel.....	College Rhetoric I.
Nineteenth Century Literature.....	College Rhetoric I.
American Literature .....	College Rhetoric.
<b>ENTOMOLOGY.</b>	
Insect Morphology .....	General Entomology.
Horticultural Entomology .....	General Entomology.
General Economic Entomology .....	General Entomology.
General Advanced Entomology .....	General Entomology.
Milling Entomology .....	General Entomology.
<b>FORESTRY.</b>	
Farm Forestry .....	None.
Dendrology .....	None.
Silviculture .....	Farm Forestry and Dendrology.
<b>GERMAN.</b>	
Elementary German I.....	None.
Elementary German II.....	Elementary German I.
German Readings .....	Elementary German II.
German Comedies .....	German Readings.
Scientific German I.....	German Readings.
Scientific German II.....	Scientific German I.
<b>HISTORY.</b>	
Modern Europe .....	None.
American History I.....	None.
American History II.....	American History I.
European Industrial History.....	None.
Kansas History .....	None.
Business Law .....	None.
Farm Law .....	None.
<b>HORTICULTURE.</b>	
Pomology .....	None.
Kitchen Gardening .....	None.
Small Fruits .....	Plant Propagation.
Ornamental Gardening .....	None.
Advanced Pomology .....	Pomology I.
Principles of Orcharding .....	Plant Propagation, Advanced Pomology.
Spraying .....	Chemistry I, II.
Orchard Management .....	None.
Market Gardening .....	None.
Landscape Gardening .....	None.
Landscape Plans and Materials.....	None.
Greenhouse Construction and Manag'm't, .....	None.

*Electives for Students—continued*

<i>Subject.</i>	<i>Prerequisites.</i>
<b>INDUSTRIAL JOURNALISM.</b>	
Farm Writing .....	Elementary Journalism.
Gathering News.....	Farm Writing.
Journalism Practice I to VI.....	Preceding Terms in Journalism Practice.
Copy Reading .....	Gathering News.
Newspaper Law .....	Copy Reading.
Editorial Practice .....	Newspaper Law.
<b>MILLING INDUSTRY.</b>	
Commercial Grain and Grain Inspection, Grain Products .....	Cereal Crop Production.
Experimental Milling .....	Commercial Grain and Grain Inspection.
Advanced Experimental Milling.....	Grain Products.
Wheat and Flour Testing.....	Experimental Milling.
	Commercial Grain and Grain Inspection, Grain Products, and Quantitative Analysis (6 credits).
Experimental Baking Tests.....	Wheat and Flour Testing.
Milling Practice .....	Advanced Experimental Milling.
<b>POULTRY HUSBANDRY.</b>	
Practice in Poultry Feeding .....	None.
Practice in Incubation .....	None.
Practice in Brooding .....	Practice in Incubation.
Practice in Candling .....	None.
Practice in Caponizing and Dressing...	None.
Breeds and Breed Types.....	None.
Advanced Judging .....	Breeds and Breed Types.
Poultry Management .....	None.
Home Poultrying .....	None.
Practice in Milk Feeding.....	None.
<b>SOCIOLOGY.</b>	
Social Psychology .....	None.
Rural Sociology .....	None.
Community Surveys .....	None.
<b>ZOOLOGY.</b>	
Advanced Zoology I, II, III.....	Zoology I, II, and Embryology.
Advanced Mammalian Embryology.....	Zoology I, II, and Embryology.
General Zoology Technique.....	Zoology I, II.
Parasitology .....	Zoology I, II.
Evolution of Domestic Animals.....	Zoology I, II, and Embryology.
Economic Zoology .....	Zoology I, II.

### Course in Veterinary Medicine

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

#### FRESHMAN

FALL	WINTER	SPRING
Anatomy I 6½ (1-11)	Anatomy II 6½ (1-11)	Anatomy III, 4 (1-6) <i>or</i> Anatomy IV, 5 (2-6)
Chemistry I 4 (3-2)	Chemistry II 4 (2-4)	Chemistry III 4 (3-2)
General Zoölogy I 4 (2-4)	General Zoölogy II 4 (2-4)	Embryology 4 (2-4)
	Histology I 4 (2-4)	Histology II 4 (2-4)
Market Types and Classes of Stock 4 (1-6)	Poultry Management 2 (2-0)	Breeding Types I 4 (1-6)
Military Drill	Military Drill	Military Drill

#### SOPHOMORE

Anatomy IV, 5 (2-6) <i>or</i> Anatomy III, 4 (1-6)	Anatomy V 4 (1-6)	Anatomy VI 3 (1-4)
Histology III 4 (2-4)	Comparative Physiology I 7 (5-4)	Comparative Physiology II 7 (5-4)
El. Organic Chemistry 4 (4-0)	Qualitative Analysis 4 (2-4)	Principles of Feeding 4 (4-0)
Medical Botany 3 (1-4)	Pathogenic Bacteriology I 4 (2-4)	
English I 4 (4-0)	English II 4 (4-0)	College Rhetoric I 4 (4-0)
Military Drill	Military Drill	Military Drill

#### JUNIOR

Pathology I 7 (5-4)	Pathology II 7 (4-6)	Pathology III 7 (4-6)
Materia Medica I 4 (4-0)	Materia Medica II 2 (2-0)	
Pharmacy 3 (1-4)	Therapeutics I 2 (2-0)	Therapeutics II 4 (4-0)
Surgery I 3 (3-0)	Surgery II 3 (3-0)	Surgery III 3 (3-0)
Diagnosis 3 (3-0)	Medicine I 3 (3-0)	Medicine II 3 (3-0)
	Pathogenic Bacteriology II 4 (2-4)	Serum Therapy 4 (3-2)
Clinic 6 (0-12)	Clinic 6 (0-12)	Clinic 6 (0-12)

#### SENIOR

Surgery IV 3 (3-0)	Surgery V 3 (3-0)	Surgery VI 3 (3-0)
Medicine III 3 (3-0)	Infectious Diseases 4 (4-0)	Sanitary Medicine 4 (4-0)
History of Breeds and Pedigrees 4 (2-4)	Principles of Animal Breeding 4 (4-0)	Conformation and Soundness 2 (2-0)
Horseshoeing 2 (2-0)	Parasitology 3 (2-2)	Meat Inspection 4 (4-0)
Operative Surgery I 2 (0-4)	Operative Surgery II 2 (0-4)	Dairy Inspection II 2 (0-4)
Obstetrics 5 (4-2)	Jurisprudence 2 (2-0)	
	Ophthalmology 2 (2-0)	
Clinic 6 (0-12)	Clinic 6 (0-12)	Clinic 6 (0-12)

**AGRONOMY**

Professor CALL  
 Assistant Professor SALMON  
 Assistant Professor THROCKMORTON  
 Assistant CUNNINGHAM  
 Assistant WILSON  
 Assistant KENNEY  
 Assistant MILLAR  
 Assistant WIRT  
 Assistant BLEDSOE  
 Assistant BONNETT  
 Assistant GRIMES  
 Fellow McNALL  
 Fellow LATOURETTE  
 Fellow SIEGLINGER

The College farm used by the Department of Agronomy comprises 320 acres of medium rolling upland soil, well suited to experimental and demonstration work. It is well equipped with all kinds of farm machinery necessary in crop production. The general fields and experimental plots used for the breeding and testing of farm crops, and for conducting soil-fertility experiments and experiments in methods of soil culture, afford the student excellent opportunities for study and investigation.

A large and well-equipped laboratory for soil physics and soil-fertility work is maintained for the regular use of students. Laboratories for grain judging and crop judging are maintained for students taking this work. Material is provided for the use of the students in the study and determination of the grains and forages best adapted to different purposes and most suitable for growing under different soil and climatic conditions. Ample greenhouse space is provided for the students' use in germinating seeds under varying soil-moisture conditions, at different depths of planting, and with varying degrees of temperature; and for research work in soils during the winter months.

The farm-mechanics laboratory is well supplied with representative types of farm machinery for demonstration and illustrative purposes in farm mechanics. Different makes of all kinds of farm machinery are supplied by implement manufacturers for study and investigation.

The Department of Agronomy offers courses in grain judging, crop production, soil physics, soil fertility, soil surveying, farm mechanics, irrigation and drainage, and farm management.

The following detailed description of courses will give a definite understanding of each subject given, its position in the course, and the proportion of time devoted to class and to laboratory work.

**COURSES IN FARM CROPS**

1.—CEREAL CROP PRODUCTION. Sophomore year, fall term. Class work, three hours; laboratory, four hours. Five credits. Required in the course in agriculture; elective in the course in general science.

This course is a study of cereal crops, largely from a production viewpoint. The crops considered are corn, wheat, oats, barley, rye, rice, buckwheat, and grain sorghum. The origin, the history of development, and the factors influencing growth, are studied. Facts designating the best place in a rotation of crops are presented. Proper seed-bed preparation, cultural methods, and factors which tend to maximum production, receive highest consideration.

*Laboratory.*—In the laboratory a study of the physical characters of each of the cereal crops is made.



2.—FORAGE CROPS. Sophomore year, winter term. Class work, three hours; laboratory, two hours. Four credits. Required in the course in agriculture; elective in the course in general science. Prerequisite: Cereal Crop Production.

This course includes a study of forage and fiber crops, with special reference to history, method of development, growth, distribution, culture, and uses. The culture and the adaptation of perennial grasses for hay and pasture are considered. Annual forage crops, including sorghums, rape, millets, legumes, and cereals, are studied with reference to their production and uses for pasture, silage, soiling, fodder, and hay.

*Laboratory.*—In the laboratory both sheaf and mounted specimens of forage crops are studied. In the greenhouse about fifty types of forage plants are kept growing for laboratory use. The student is, therefore, given an opportunity to become familiar with the structure and growth of many forage plants. A study is made of the different commercial tame grasses and clovers and their seeds, with special reference to quality, purity, and freedom from adulterants and weed seeds.

3.—FORAGE CROP IMPROVEMENT. Senior year, fall term. Class work, one hour; laboratory, six hours. Four credits. Elective in the course in agriculture. Prerequisite: Principles of Breeding.

This is an advanced course in forage crops and their improvement, especially from the breeder's standpoint. The lectures deal with forage-crop investigations.

*Laboratory.*—The laboratory period is devoted to the collecting, compiling, classifying and card-indexing of the data on this subject. Special subjects are assigned to each student for presentation to the class. The individual desires of each student and his interest in a particular crop are allowed to govern assignments of subjects.

4.—PRINCIPLES OF AGRONOMIC EXPERIMENTATION. Senior year, winter term. Class work, one hour; laboratory, six hours. Four credits. Elective in the course in agriculture. Prerequisites: Forage Crops, Soil Fertility, Forage Crop Improvement, and Principles of Breeding.

This is an advanced course in technical experimentation along agronomic lines. The lectures deal with the history and development of experiments with soils and field crops. Attention is called to the arrangement of the crops on an experiment farm as regards adaptation to soil and topography. The size, the management, and the shape of plots for crop and soil, or joint research, are considered. The method and theory of check plots and the duplication of experiments are discussed. The residual effects and the seasonal influences and their effects upon the following year's work are considered, together with means of overcoming these factors. The methods of experimentation followed at various stations are discussed.

*Laboratory.*—The laboratory period is devoted to the working out of results secured in actual experimental operations and the compiling of these data.

5.—ADVANCED GRAIN JUDGING. Senior year, fall term. Laboratory, four hours. Two credits. Elective in the course in agriculture. Prerequisite: Agronomy 1.

This course consists of the study of grain. It includes the determination of moisture and the effect of excessive moisture on the quality of grain. A study is made of the effect of mixed varieties and foreign material upon quality. These studies are made with reference to conditions during production, harvesting, and marketing. The course includes the judging and commercial grading of grain.

6.—CEREAL CROP IMPROVEMENT. Senior year, spring term. Lecture, one hour; laboratory, six hours. Four credits. Elective in the course in agriculture. Prerequisites: Forage Crops, Taxonomic Botany, and Principles of Breeding.

This is an advanced study of the cereal crops and methods for their improvement. The laws and principles underlying the breeding of cereals are given special attention. The lectures deal with systems of grain crop management and factors affecting their improvement.

*Laboratory.*—The laboratory period is used partly for the collection, reading and classification of material concerning cereal improvement. Various assignments are given the students. So far as possible, the individual desires of each student and his interest in a particular crop are allowed to govern the assignment of subjects.

### COURSES IN SOILS

7.—SOILS. Junior year, winter term. Class work, three hours; laboratory, four hours. Five credits. Required in the course in agriculture; elective in the course in general science. Prerequisites: Agricultural Chemistry, Geology, and Bacteriology.

This course comprises a study of the physical nature of soils, and deals with the origin of soils and their formation; soil texture as influencing aëration, capillarity, and diffusion; soil moisture and means for its conservation; the washing of soils and preventive measures; the effect of different methods of cultivation upon the liberation of plant foods, soil moisture, and soil temperature; the use of tillage implements and their effect upon the physical condition of the soil.

*Laboratory.*—The practicums demonstrating the principles of soil physics are discussed in the class.

8.—SOIL FERTILITY. Junior year, spring term. Class work, three hours; laboratory, two hours. Four credits. Required in the course in agriculture; elective in the course in general science. Prerequisites: Agricultural Chemistry, Quantitative Analysis I, and Soils.

This course involves a study of the food combinations of plants and the effect of different amounts of combinations of plant food upon plant growth; the effect of different crops and different systems of farming upon the depletion of soil fertility; the use of barnyard manure, including proper methods of handling, preserving, and applying it; a determination of the need of soils for commercial fertilizers and the kind of fertilizers to apply.

*Laboratory.*—The laboratory exercises supplement the class work in demonstrating the effect of fertilizers and manures upon plant growth.

9.—SOIL SURVEY. Junior year, spring term. Lectures and recitations, two hours; laboratory, four hours. Four credits. Elective in the course in agriculture. Prerequisite: Soils.

This subject is pursued by lectures and recitations on the types of soil of the United States as classified by the Bureau of Soils, United States Department of Agriculture, and the adaptability of different crops to these soil classes. A study is also made of the soil surveys of different states, and especially of the soil survey of Kansas.

*Laboratory.*—Field work in mapping soils comprises the laboratory work.

10.—ADVANCED SOILS. Senior year, fall term. Class work, two hours; laboratory, four hours. Four credits. Elective in the course in agriculture. Prerequisites: Geology, Soils.

This course is a brief study of the principal soil-forming rocks and minerals and their influence upon the texture, physical properties and fertility of the soil. The various methods of determining the physical composition of the soil are considered.

*Laboratory.*—The laboratory is a continuation of the work begun in Soils.

11.—SOIL RESEARCH I. Senior year, winter term. Laboratory, eight hours. Four credits. Elective in the course in agriculture. Prerequisites: Advanced Quantitative Analysis (four credits), Soil Bacteriology, and Advanced Soils.

The student taking this course pursues a definite line of laboratory work on some soil problem. During the winter term the work is principally in the greenhouse and the laboratory, but includes assigned readings. In the spring term an opportunity is afforded to carry into the field lines of research started in the greenhouse and the laboratory.

12.—SOIL RESEARCH II. Senior year, spring term. Laboratory, eight hours. Four credits. Elective in the course in agriculture. Prerequisite: Soil Research I.

This course is a continuation of Soil Research I.

### COURSES IN FARM MECHANICS

13.—FARM MECHANICS. Sophomore year, spring term. Class work, two hours; laboratory, four hours. Four credits. Required in the course in agriculture; elective in the course in general science.

This is a beginning course in farm mechanics, taking up certain important definitions and mechanical principles—force, work, power, and the lever, eveners, tackles, etc. It includes a study of power transmission, belting, splicing, etc., strength of materials, tillage machinery, history, development and construction of plows, harrows, rollers, subsurface packers, cultivators, etc., and also a study of seeding, grading, harvesting, haying, threshing, guiding, and pumping machinery.

14.—ADVANCED FARM MECHANICS. Senior year, fall term. Lectures, one hour; laboratory, six hours. Four credits. Elective in the course in agriculture. Prerequisite: Farm Mechanics.

Different makes of implements are compared as to simplicity of construction, draft, and adaptability to the purpose for which manufactured. Practical field and laboratory tests of farm machines are conducted with various forms of power. Appropriate instruction is given in the care of all classes of farm implements.

15.—FARM BUILDINGS AND EQUIPMENT. Senior year, winter term. Lectures, two hours; laboratory, four hours. Four credits. Elective in the course in agriculture. Prerequisite: Farm Mechanics.

This subject involves a study of the permanent equipment and conveniences of the farm, such as fences, outbuildings, cribs, barn, and machine sheds. The use of concrete for construction work on the farm will be given special attention.

16.—IRRIGATION AND DRAINAGE. Senior year, spring term. Class work, two hours; laboratory, four hours. Four credits. Elective in the course in agriculture. Prerequisites: Farm Mechanics, Soil Fertility.

This course involves study and field practice in the fundamentals common to both irrigation and drainage. Problems are given on the length of pace, and on the determination of distances by pacing and by the use of the surveyor's chain, and farm mapping. A study is made of drainage systems in operation. The College has a drainage system under way, and practical work is given the students in running levels and in trenching and placing tile. Each student is required to plan an entire drainage system and to estimate its cost.

## COURSE IN FARM MANAGEMENT

17.—FARM MANAGEMENT. Senior year, winter term. Lectures and recitations, three hours; laboratory, two hours. Four credits. Required in the course in agriculture; elective in the course in general science. Prerequisites: Forage Crops, Soil Fertility.

The purpose of this course is: first, to assemble and correlate the principles involved in the agricultural subjects taught in the institution; second, to aid the student in applying these principles to the successful management of a farm. Lectures are given on the points to be considered in the selection of a farm, on types of farming, on the planning and arrangement of the farmstead and of the fields and the crops; on the ease, cost and methods of marketing different farm products. Different regions are discussed with especial reference to their adaptability to certain types of farming. Farm records and accounts are kept. The labor question is analyzed. The distribution of capital, its relation to profit, and the relation of live stock to crop production and to the maintenance of a permanent agriculture, receive consideration. Rural conditions with respect to people, roads, schools, churches and social conveniences also find consideration in the course. Methods of renting and leasing farms are discussed, and their important points emphasized.

*Laboratory.*—At the beginning of the course the student is required to furnish plans and inventories of his own farm or of a farm with which he is familiar, together with a financial record of one year's actual operations. The farm is then replanned in accordance with the principles developed in this course. Whenever practicable, neighboring farms are visited and studied with the idea of securing first-hand information as to the farm plan, especially with respect to the arrangement of the fields, to the buildings, to the farmstead, and to the rotation of crops used. Text, Warren's *Farm Management*.

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### Animal Husbandry

Professor COCHEL  
 Assistant Professor McCAMPBELL  
 Assistant Professor \_\_\_\_\_  
 Instructor VESTAL  
 Assistant LEWIS  
 Assistant BLIZZARD  
 Assistant GATEWOOD  
 Assistant PATERSON  
 Assistant VANDERWILT

The Department of Animal Husbandry owns about 140 acres of land and rents 460 acres for the maintenance of herds and flocks of pure-bred horses, cattle, sheep, and hogs. The College live stock has attained a national reputation among breeders and feeders on account of the many prize-winning animals produced.

The feed yards and barns are well arranged for experimental feeding and the maintenance of the herds. The laboratory of the animal husbandry student is, as a matter of fact, the feed yard and the animal. He studies the animal from the standpoint of the breeder and of the feeder, and learns to combine the needs of each and to find these qualities exemplified in the perfect animal.

The courses of study in this department are so arranged as to give the student special instruction in the selection, breeding, feeding, marketing and management of all classes of live stock. Attention is also given to the sanitary conditions and treatment of the more common forms of disease to which the animals are subject.

## COURSES IN ANIMAL HUSBANDRY

1.—MARKET TYPES AND CLASSES. Freshman year, fall term. Class work, one hour; laboratory, six hours. Four credits. Required in the course in agriculture; elective in the course in industrial journalism and in the course in general science.

This course consists of a study of the market types and classes of horses, cattle, sheep, and swine. Text, Craig's *Live-stock Judging*.

*Laboratory*.—Practice in scoring and judging animals.

2.—BREEDING TYPES AND CLASSES. Freshman year, winter term. Class work, one hour; laboratory, six hours. Four credits. Required in the course in agriculture; elective in the courses in general science, veterinary medicine, and industrial journalism. Prerequisite: Market Types and Classes.

This course consists of a study of the types and classes of horses, cattle, sheep, and swine from the standpoint of both grade and pure-bred animals used for breeding purposes. Text, Craig's *Live-stock Judging*.

*Laboratory*.—Practice is given in scoring and judging breeding animals.

3.—BREEDING TYPES I. Freshman year, spring term. Class work, one hour; laboratory, six hours. Four credits. Special course for veterinary students only. Prerequisite: Market Types and Classes.

This course consists of a study of the more important breeds of horses, beef cattle, dairy cattle, sheep, and swine. One-third of the time required in this course is devoted to the study of dairy cattle, during which time the class is in charge of the Department of Dairy Husbandry. Text, Craig's *Live-stock Judging*.

*Laboratory*.—Practice is given in scoring and in judging.

4.—PRINCIPLES OF FEEDING. Sophomore year, spring term. Lecture, two hours; recitation, two hours. Four credits. Required in the course in agriculture and in the course in veterinary medicine. Prerequisites: Market Types and Classes; Breeding Types and Classes.

This course involves a study of the digestive system and the processes of nutrition, and of the theory of practical economy of rations, both for the maintenance and for the fattening of all classes of farm animals.

5.—HISTORY OF BREEDS AND PEDIGREES. Junior year, fall term. Class work, two hours; laboratory, four hours. Four credits. Elective in the course in agriculture. Prerequisite: Principles of Feeding.

A study is made of the early history and development of pure-bred domestic animals; also a sufficient study of herd books and pedigrees to acquaint students with the leading strains and families of the different breeds of horses, cattle, sheep, and swine. Text, Plumb's *Types and Breeds*.

6.—LIVE-STOCK MANAGEMENT I. Junior year, fall term. Laboratory, four hours. Two credits. Elective in the course in agriculture.

Practice is given in the feeding, care, and management of cattle and hogs.

7.—PRINCIPLES OF ANIMAL BREEDING. Junior year, winter term. Class work, four hours. Four credits. Required in the course in agriculture and in the course in veterinary medicine. Prerequisites: Zoölogy I, II, and III; Embryology.

This course embraces the general study of the principles of breeding, including a study of selection, variation, heredity, atavism, etc. Text, Davenport's *Thremmatology*.

8.—PORK AND MUTTON PRODUCTION. Junior year, winter term. Class work, three hours. Three credits. Elective in the course in agriculture. Prerequisite: Principles of Feeding.

This course comprises a systematic study of the most successful and economical methods of growing and finishing hogs and sheep, both for breeding purposes and for pork and mutton production.

9.—LIVE-STOCK MANAGEMENT II. Junior year, spring term. Laboratory work, four hours. Two credits. Elective in the course in agriculture. Prerequisite: Principles of Feeding.

This course deals with the practical side of the feeding, care, and management of horses and sheep.

10.—ADVANCED JUDGING I. Junior year, spring term. Laboratory, four hours. Two credits. Elective in the course in agriculture. Prerequisites: Market Types and Classes; Breeding Types and Classes; and History of Breeds and Pedigrees.

This course deals with the judging of market classes as well as with all of the different breeds of pure-bred stock. The stock is judged in groups of from four to six animals in the same manner that is customary at county or state fairs.

11.—ADVANCED JUDGING II. Senior year, fall term. Laboratory, four hours. Two credits. Elective in the course in agriculture. Prerequisite: Advanced Judging I.

This is a continuation of Advanced Judging I. During the work of the term, occasional trips are made to the best live-stock farms of the state, where the students have an opportunity to judge and to observe the management of herds and flocks as handled by the most successful stockmen of the state.

12.—BREEDING PURE-BRED LIVE STOCK. Senior year, fall term. Two credits. Prerequisite: Advanced Judging I.

The practices in breeding pure-bred live stock are here studied.

13.—MEATS. Senior year, winter term. Class work, one hour; laboratory, two hours. Two credits. Elective in the course in agriculture. Prerequisites: Principles of Feeding; Principles of Animal Breeding.

This course includes a study of the killing, dressing, cutting, and curing of beef, pork, and mutton.

14.—BEEF PRODUCTION. Senior year, spring term. Class work, two hours. Two credits. Elective in the course in agriculture. Prerequisite: Advanced Judging I.

This course is devoted to a study of the most successful and economical methods of producing beef cattle for market. Various rations, comparisons of long and short feeds, the advisability of grain and of grass feed, and all questions pertaining to the production of beef are considered.

15.—HORSE PRODUCTION. Senior year, spring term. Class work, three hours. Three credits. Elective in the course in agriculture. Prerequisite: Principles of Feeding.

This course involves a study of the most successful methods of growing and developing young horses and mules and of the most satisfactory rations for horses, together with an investigation of the best methods of preparing horses for market.

16.—ANIMAL HUSBANDRY SEMINAR. Senior year, spring term. One credit. Prerequisites: History of Breeds and Pedigrees, Breeding Pure-bred Live Stock.

## Dairy Husbandry

Professor REED  
Instructor FITCH  
Instructor GILBERT  
Assistant TOMSON

The College dairy farm, including the buildings and yards, consists of about seventy acres of medium upland. This land is used for growing corn, alfalfa, and other crops, such as cowpeas, field peas, and sorghum, and for the pasture of the dairy herd.

The barn is built on the most approved model for the housing of dairy cattle, and is light, well-ventilated, and sanitary, with stalls for seventy cows. Three silos of modern type, feed rooms, a milk room, a boiler room, and a laboratory exist in connection with the barn. Each of these illustrates some especially desirable feature in dairy building and construction.

The dairy herd consists of excellent types of the four dairy breeds: Jersey, Guernsey, Ayrshire, and Holstein. These animals are pure-bred and a number have been entered in the advanced registry of their respective breeds. The excellence of the dairy herd is shown by an average production for the past year of over 400 pounds of butter by the Guernseys, 475 pounds by the Ayrshires, over 500 pounds by the Jerseys, and 572 pounds by the Holsteins. Maid Henry, a thirteen-year-old Holstein, produced 19,600 pounds of milk, yielding 835 pounds of butter in one year. The Owl's Design ranks high among the Jerseys of the world, with a record of 14,606 pounds of milk produced in one year. She has also produced 758 pounds of butter in a year.

The dairy building houses the creamery, the cheese rooms, the classrooms, and the offices, and the necessary laboratories for testing and hand-separator work. Refrigeration is secured from a small refrigerating machine and ice plant installed in the building. These facilities of barn, herd, and laboratories are in constant use by the students of dairying. The instruction in dairy husbandry includes the study of the selection and breeding of dairy animals, the production of milk, its manufacture into butter, cheese, and other dairy products, or its sale on the market.

## COURSES IN DAIRY HUSBANDRY

1.—ELEMENTS OF DAIRYING. Sophomore year, spring term. Class work, two hours; laboratory, four hours. Four credits. Required in the course in agriculture; elective in the course in general science.

This is a general course in dairying, dealing with the secretion, composition and properties of milk, with the factors influencing the quantity and quality of milk, and with the care of milk and cream on the farm. It includes a study of the different methods of creaming, the construction and operation of farm separators, the principles and application of the Babcock test, the use of the lactometer, and butter making on the farm. Lectures, supplemented by text, *Wing's Milk and Its Products*.

*Laboratory.*—Practice is given in operating the Babcock test and lactometer, separation of milk, and farm butter making.

2.—DAIRY JUDGING. Freshman year, spring term. Laboratory, four hours. Two credits. Required in the course in agriculture and in the course in veterinary medicine; elective in the course in general science.

This course calls for the judging of dairy stock from the standpoint of economical production and breed type. Score cards are used for the purpose of training the student to become accurate, thorough and systematic in the selection of animals as representatives of breeds or for breeding purposes. No textbook is required. *Types and Breeds of Farm Animals*, by C. S. Plumb, and Breed Association literature are used as references.

3.—BREEDING TYPES I. Freshman year, spring term. Required in the course in veterinary medicine.

One-third of this course, which is described more fully under the Department of Animal Husbandry, is given by members of the Department of Dairy Husbandry, and comprises the judging and scoring of dairy cattle.

4.—DAIRY INSPECTION I. Junior year, spring term. Class work, one hour; laboratory, two hours. Two credits. Elective in the course in agriculture. Prerequisites: General Bacteriology; Chemistry D-I and D-II.

Advanced work is given in the testing of dairy products, including testing for adulterations. Practice is given in the use of score cards for inspecting and grading milk depots, dairy farms, and creameries. The course is designed to give training in the duties of a city, state, or government inspector or commissioner. State and city ordinances governing the handling and public sale of dairy products are outlined. Text, Farrington and Woll's *Testing Milk and Its Products*.

5.—PURE-BRED DAIRY CATTLE. Junior year, fall term. Class work, two hours; laboratory, two hours. Three credits. Elective in the course in agriculture.

Lectures are given on the origin, history, and development of breeds of dairy cattle, their distribution, and their distinctive characteristics.

*Laboratory.*—This work consists of a study of methods of registering animals, and of practice in tracing and making pedigrees and in keeping advanced registry records.

6.—MILK PRODUCTION AND HERD MANAGEMENT. Junior year, winter term. Class work, three hours. Three credits. Elective in the course in agriculture. Prerequisite: Principles of Feeding.

This course deals with the economical production of milk and with the most approved methods of handling a dairy herd. Special attention is given to breeding, feeding, keeping herd records, forming test associations, and organizing plans for improvement of quality of dairy cattle.

7.—BUTTER MAKING AND CREAMERY MANAGEMENT. Senior year, fall term. Class work, three hours; laboratory, four hours. Five credits. Elective in the course in agriculture.

This course comprises a study of the principles of creamery butter making, the construction and care of creameries and their appliances, methods of sampling and grading cream, pasteurization, starter making, cream ripening, and creamery accounting. Text, McKay and Larson's *Principles and Practice of Butter Making*.

*Laboratory.*—Practice is given in the sampling and grading of milk and cream; in separating and ripening cream; in the preparation and use of the starter in pasteurized and in raw cream; in churning; in working, washing, salting, and packing butter; and in keeping complete records of each operation. The work also includes the making of salt, fat, and moisture determinations of the finished product, and judging and scoring butter.



8.—CHEESE AND ICE-CREAM MAKING. Senior year, spring term. Class work, two hours; laboratory, four hours. Four credits. Elective in the course in agriculture. Prerequisites: Chemistry D-I and D-II; Dairy Bacteriology.

This course includes the making of cheese on the farm for home use and for sale, and the commercial manufacture of Cheddar cheese, comprising each detail from the receipt of the milk to the marketing of the finished product. The cheese work is given in the first half of the term; the manufacture and handling of ice cream and ices for the retail and wholesale trade, in the second half. Text, Van Slyke-Publow's *The Science and Practice of Cheese Making*.

*Laboratory.*—Practice is given in making cheese under farm conditions and on a commercial scale. Records are kept of the different operations, and their influence upon the finished product is noted. Exercises are given in testing, judging, and scoring cheese. The latter half of the term is devoted to the making of ice cream and ices.

9.—DAIRY BUILDINGS AND EQUIPMENT. Junior year, spring term. Class work, two hours. Two credits. Elective in the course in agriculture.

This work consists in drawing plans for the construction of dairy barns, storage barns, silos, milk rooms, dairies, ice houses, fences, and shelters, and in planning and laying out dairy plants for special purposes.

10.—ADVANCED DAIRY JUDGING. Elective, spring term. Laboratory, two hours. One credit.

This course is a continuation of Live Stock III. Visits are made to the best dairy farms in the State, and students are given an opportunity to judge and to handle stock kept by the most successful breeders.

11.—DAIRY SEMINAR. Elective, spring term. Class work, two hours. Two credits. Prerequisites: Courses 1, 4, 5, and 6.

This course includes a study and review of dairy periodicals and experiment station bulletins, books, and other dairy literature.

12.—DAIRY INSPECTION II. Senior year, spring term. Laboratory, four hours. Two credits. Required in the course in veterinary medicine.

This course comprises the testing of dairy products, the inspection and scoring of dairies and milk depots, and the testing for adulterants in dairy products. Text, Farrington and Woll's *Testing Milk and Its Products*.

13.—HOME DAIRYING. Elective, winter term. Class work, two hours; laboratory, four hours. This course extends over half a term and carries two credits. For young women only; elective in the course in home economics.

This course includes a study of the composition of milk, Babcock testing, separation of milk, cream ripening, and farm butter making; also a brief study of the breeds of dairy cattle. This course is given with the elective course in Home Poultrying, offered by the Department of Poultry Husbandry in the first half of the term.

## Forestry

Forester SCOTT

The Department of Forestry, established by authority of an act of the legislature in 1909, is in charge of forestry extension and investigations throughout the State, and of the College instruction in these subjects.

The great importance to State and nation of conserving the present area of woodland and of adding to it by plantings upon every farm is universally acknowledged. The direct value to the farm of supplies of posts, poles, and fuel is readily computed, but the value to the State of these timber areas in the protection to soil, conservation of moisture, and improved landscape effect, is even more important in the agricultural welfare of the State and of the citizen.

### COURSES IN FORESTRY

1.—FARM FORESTRY. Senior year, winter term. Class work, three hours; laboratory, two hours. Four credits. Required in the course in agriculture; elective in the course in general science.

This course covers, in a general way, the propagation of forest trees; nursery methods and practices; the cultivation and care of trees in farm wood-lots; the preparation of planting plans for farm wood-lots; a detailed study of trees suitable for such planting in the various parts of the State; the value of the timber crop; the composition and location of windbreaks, their value in the protection of growing crops and in the conservation of soil moisture. The class work is given by means of lectures and mimeographed notes.

2.—DENDROLOGY. Elective, winter term. Class work, one hour; laboratory, two hours. Two credits. Elective in the courses in agriculture and general science.

This course takes up the classification and identification of forest trees growing on the campus and in the vicinity of Manhattan, by means of bud and twig characteristics, as well as by leaf, flower, and fruit characteristics.

3.—SILVICULTURE. Elective, winter term. Class work, two hours; field work, two hours. Three credits. Elective in the course in agriculture and elsewhere. Prerequisites: Farm Forestry; Dendrology.

A study is made of the forest regions of the United States; the commercial range of the important economic species, their soil and climatic requirements; forest types; tolerance and intolerance of trees; factors determining reproduction and rate of growth; the protection of forests against injury by fires, winds, and insects, including the application of several silvicultural systems.

## Horticulture

Professor DICKENS  
Associate Professor AHEARN  
Assistant LEWIS  
Assistant MERRILL

A wealth of illustrative material for classes in all horticultural subjects is found in the large collection of species growing upon the College campus, in the orchard plantations, and in the greenhouses. The new greenhouses have added greatly to the possibility of effective laboratory work.

The horticultural grounds consist of eighty acres of land devoted exclusively to horticultural and forestry work and gardens, and to nurseries. Orchards and vineyards are maintained for experimental and demonstrative work. A full equipment of tools, spraying machinery, and special apparatus used in horticulture, floriculture and gardening is available for the use of the students. The College grounds furnish one of the finest laboratories in the State for the study of landscape gardening.

The instruction in the Department of Horticulture covers fruit judging, plant propagation, pomology, gardening, small fruits, spraying, orcharding, and landscape gardening. The following descriptions give detailed accounts of the instruction in these various fields.

### COURSES IN HORTICULTURE

1.—PLANT PROPAGATION. Sophomore year, spring term. Class work, three hours; laboratory, four hours. Five credits. Required in the course in agriculture; elective in the course in general science. Prerequisite: Plant Anatomy.

A discussion of natural and cultural methods of propagation; seeds, seed testing, and seed growing; the treatment required for different kinds of seeds, the production of seedlings for stock; grafting, budding, layering; the making of cuttings, and the special requirements for propagating commercial fruits and ornamental plants. The work is given by means of lectures and assigned readings.

*Laboratory.*—Practical work is given in the preparation of seeds and in seed testing; in the preparation of seed-beds, and the use of seeding machinery; in transplanting, grafting, budding, and in general nursery practice.

2.—POMOLOGY I. Junior year, fall term. Laboratory, four hours. Two credits. Elective in the course in agriculture.

The course comprises exercises in grading and packing fruit, in selecting specimens, and in the preparation of exhibits; identification and description of varieties; identification of diseases and of injuries which damage storage fruits.

3.—KITCHEN GARDENING. Senior year, fall term. Class work, two hours. Two credits. Required in the course in home economics.

Lectures are given on the requirements for home-grown vegetables and other plants; on soils, fertilizers, and seeds; on the planting, cultivation, and needs of various groups of species.

4.—SMALL FRUITS. Junior year, spring term. Class work, two hours. Two credits. Elective in the course in agriculture. Prerequisite: Plant Propagation.

The small fruits of commercial importance are considered with reference to their requirements as to soil, fertilizers, cultivation, and protection. The management of small areas designed to furnish a supply of fruits for home use, and the handling of commercial plantations, are considered.

5.—ORNAMENTAL GARDENING. Senior year, spring term. Class work, two hours. Two credits. Required in the course in home economics.

Lectures are given on the principles of landscape art and their application to the problems of lawns, yards, country homes, and school grounds. Opportunity is afforded for an acquaintance with the species used for obtaining the best results.

6.—ADVANCED POMOLOGY. Senior year, fall term. Class work, three hours; laboratory, two hours. Four credits. Elective in the course in agriculture. Prerequisite: Pomology I.

The course comprises a detailed study of systems of classification, natural and artificial, and of the influence of conditions and culture upon variation. Systems of description and nomenclature are treated. Text, Waugh's *Systematic Pomology*.

*Laboratory.*—The laboratory work consists of identification and description of varieties; observations on variations in specimens grown in different localities and under varying conditions.

7.—PRINCIPLES OF ORCHARDING. Senior year, winter term. Class work, three hours. Three credits. Elective in the course in agriculture. Prerequisites: Plant Propagation; Advanced Pomology.

This course consists of a discussion of the conditions necessary for success with orchards, including location, improvements of soil, application of fertilizers, pruning. Text, Bailey's *Principles of Fruit Growing*.

8.—SPRAYING. Senior year, winter term. Class work, one hour; laboratory, four hours. Three credits. Elective in the course in agriculture. Prerequisites: Chemistry I and II.

Practice is given in preparing spray mixtures, and in the use of spraying machinery.

9.—ORCHARD MANAGEMENT. Class work, two hours; laboratory, four hours. Four credits.

This is a detailed study of the capital and equipment necessary for the handling of orchards of varying age and size, and of requirements of marketing, storage, and by-products.

10.—MARKET GARDENING. Senior year, spring term. Class work, two hours; laboratory, two hours. Three credits. Elective in the course in agriculture.

This course comprises a study of the problems and possibilities of the market garden, the necessary equipment, and soil requirements therefor; the value and cost of fertilizers. Text, Bailey's *Principles of Vegetable Gardening*.

*Laboratory.*—The laboratory work consists of the preparation of plans for gardens; seed testing; the construction of the hotbed; the use of tools and machines; observations on the growth of crops; management of hotbeds and forcing houses.

11.—LANDSCAPE GARDENING. Senior year, spring term. Class work, two hours; laboratory, two hours. Three credits. Elective in the course in horticulture, and in the course in general science.

This course is a study of the ideals of landscape work, and the means adopted to secure the best results in lawns, parks, public grounds, and cemeteries. Text, Waugh's *Landscape Gardening*.

*Laboratory.*—The laboratory work is in making plans for plantings of various types, including lawns, parks, and cemeteries.

12.—LANDSCAPE PLANS AND MATERIALS. Elective. Class work, two hours; laboratory, four hours. Four credits.

This elective deals with plans for street planting, the ornamentation of school grounds, city parks, and home grounds. A thorough study is made of landscape principles that apply to civic improvement.

*Laboratory.*—There are field trips, and the students are required to familiarize themselves with the more common varieties of flowers, shrubs, and trees.

13.—GREENHOUSE CONSTRUCTION AND MANAGEMENT. Class work, four hours.

This course consists of a term's work covering the more important points of greenhouse construction and the proper methods of conducting the greenhouse business. Not only is this subject treated from the commercial standpoint, but the management of private conservatories is also carefully studied.

14.—SCHOOL GARDENING. Elective, spring term. Class work, two hours; laboratory, four hours. Four credits.

The object of this course is to give teachers a knowledge of the principles which underlie success in gardening and the adaptation of small areas to the production of vegetables and flowers. The subjects of soil preparation, seed selection, fertilizers, hotbeds, plant manipulation, and the planning of the garden are given special consideration. Opportunity is given for teachers to become familiar with general garden methods and the use and manipulation of garden tools, including seeders, weeders and wheel hoes. Allotments of ground areas required for different crops, the length of time required for different crops, the length of time required to mature various vegetable and flower crops, the adaptation of these to country and city schools, and suggestions for marketing are among the subjects considered.

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## Milling Industry

Professor FITZ  
Assistant DUNTON  
Miller LEEPER

The Department of Milling Industry was primarily established by the Board of Regents to undertake investigations in the handling, marketing and milling of wheat. Every student of agriculture should have some knowledge of this subject, and also of the handling of grain products other than those obtained from wheat. A full and complete knowledge of the needs of grain growing as an industry must necessarily include the utilization of grains in the manufacture of food, together with the natural by-products resulting therefrom.

The department has a well-equipped plant, consisting of six double-stand 7" x 14" rolls, with necessary cleaning machinery and dust collectors, sifters, and purifiers. The results secured here are comparable with those from a regular commercial mill. A baking laboratory equipped with proofing closet, dough mixer, and electric ovens is open for student use, as is also a laboratory for chemical tests on wheat and flour.

1.—COMMERCIAL GRAIN AND GRAIN INSPECTION. Junior year, fall term. Class work, three hours; laboratory, two hours. Four credits. Prerequisite: Grain Crops.

This course includes a study of methods of handling, storing, marketing, and grading of grain; the history of the origin and development of

grain inspection and grades; the classification and organization of inspection systems; the organization and functions of grain exchanges or boards of trade; and principal grain markets, with receipts, shipments, and consumption.

*Laboratory.*—Actual practice in grading samples, determining dockage, and studying the kinds of damage in commercial grains, with relation to their effect on market value.

2.—GRAIN PRODUCTS. Junior year, winter term. Class work, three hours; laboratory, two hours. Four credits. Prerequisite: Commercial Grain and Grain Inspection.

A brief study of the methods of manufacturing food products from cereals, with the resulting by-products, and a comparison of composition and feeding value of these by-products.

*Laboratory.*—A study is made of actual samples of most important cereal food products and by-products.

3.—EXPERIMENTAL MILLING. Junior year, spring term. Laboratory, four hours. Two credits. Prerequisite: Grain Products.

This course includes a study of the theory and practice of milling, with demonstrations on a small experimental mill.

4.—ADVANCED EXPERIMENTAL MILLING. Senior year, fall term. Laboratory, eight hours. Four credits. Prerequisite: Experimental Milling.

This course consists of practice in the art of milling, with demonstrations on model mill.

5.—WHEAT AND FLOUR TESTING. Senior year, winter term. Class work, one hour; laboratory, six hours. Four credits. Prerequisites: Grain Products, and six credit hours of Quantitative Analysis.

This course includes special quantitative tests applied to cereals and their by-products; methods for analysis and interpretation of results.

6.—EXPERIMENTAL BAKING TESTS. Senior year, spring term. Laboratory, eight hours. Four credits. Prerequisite: Wheat and Flour Testing.

This course includes practice in making tests; comparison of methods, formulas, and flour; and interpretation of results.

7.—MILLING PRACTICE. Senior year, spring term. Laboratory, eight hours. Four credits. Prerequisite: Advanced Experimental Milling.

This course is a continuation of Advanced Experimental Milling.

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## Poultry Husbandry

Professor LIPPINCOTT  
Superintendent HARRIS

The new poultry plant is situated just north of the northeast corner of the College campus. The plant occupies eight acres, and is devoted to the breeding and rearing of the stock used for class work. It is equipped with different types of incubators, brooders, houses and runs, and with flocks of the leading breeds of fowls.

There is in the government and state experiment stations, and in schools and colleges, an increasing demand for men with experience and systematic training in poultry. There is likewise a growing demand for men capable of managing poultry farming enterprises of considerable proportions, or of entering the commercial branches of the work.

## COURSES IN POULTRY HUSBANDRY

1.—POULTRY MANAGEMENT. Freshman year, winter term. Lectures, two hours. Two credits. Required in the course in veterinary medicine.

This course takes up the general problems of poultry practice, and pays particular attention to the relation of these problems to the maintenance of health.

2.—FARM POULTRY PRODUCTION. Junior year, spring term. Class work, two hours; laboratory, two hours. Three credits. Required in the agricultural course; elective in the course in general science.

This course takes up the problems of poultry management on the general farm. The subjects of feeding, breeding, incubating, brooding and marketing are studied.

3.—PRACTICE IN POULTRY FEEDING. Elective, spring term. Three times a day, seven days a week, for a period of four weeks, at hours outside the regular schedule. One credit.

This course consists of the actual care of a flock of fowls by the student, under supervision of an instructor. Careful record is kept of the feeds used and the eggs produced. A financial statement is required at the end of the feeding period.

4.—PRACTICE IN INCUBATION. Elective, spring term. Three times a day, seven days a week, for a period of four weeks. One credit.

This course consists in the care of an incubator by the student through the incubation period, testing the eggs, and bringing off the hatch. Careful records of fertility, cost of incubation, etc., are kept.

5.—PRACTICE IN BROODING. Elective, spring term. Three times a day, seven days a week, for a period of four weeks, at hours outside the regular schedule. One credit.

In this course each student handles a flock of chicks. He has the entire care of brooding and feeding them during the four most critical weeks. A report of cost of fuel and feed, of gain in weight, and of mortality, is required. This course must be preceded or accompanied by Practice in Incubation.

6.—PRACTICE IN CANDLING. Elective, fall term. Laboratory, two hours. One credit.

This course consists in making a first-hand study of the commercial grades of eggs. Particular attention is given to those forms of deterioration found in Kansas, including blood rings, spots, heats, and green whites, which are likely to be overlooked by egg buyers. A study is also made of the relative deterioration of fertile and infertile eggs.

7.—PRACTICE IN MILK FEEDING. Elective, fall term. Twice a day, seven days a week for a period of four weeks, at hours outside of the regular schedule. One credit.

This course consists in force fattening poultry by means of crates. The time will be divided into periods of two weeks each, so that the student will have an opportunity to fatten two lots of birds. A financial statement is required.

8.—HOME POULTRYING. Elective, division of home economics, winter term, open only for women. Class work, four hours for the first half of the term. Two credits.

This course takes up the problems of poultry management for egg and meat production. The subjects of feeding, breeding, incubating, brooding, and marketing are studied. It is given with the elective course in home dairying offered by the department of dairy husbandry, in the last half of the term.

## Agricultural Extension

Dean MILLER

1.—AGRICULTURAL EXTENSION. Elective, spring term. Class work, two hours; laboratory, two hours. Three credits. Elective for seniors in the course in agriculture.

This is a brief course which considers the agricultural needs and conditions of the State, and methods to be employed to meet them; the organizations now existing or to be organized. In this course are studied the methods employed in this and other states and countries to meet special conditions peculiar to different climates and civilizations.

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## Veterinary Medicine

Professor SCHOENLEBER  
 Professor GOSS  
 Professor DYKSTRA  
 Assistant Professor BURT  
 Instructor ROGERS  
 Assistant HASLAM  
 Assistant CHRISTIAN  
 Assistant FRANKLIN  
 Assistant KENNEDY  
 Assistant HOBBS ✓  
 Assistant KIRKPATRICK  
 Assistant BENNER ✓

The Department of Veterinary Medicine gives most of the technical work in the course in veterinary medicine, a general description of which is given elsewhere. The department is housed in the Veterinary Building, which was erected at a cost of over \$60,000 and is thoroughly equipped throughout. It contains modern classrooms, and its laboratories possess the necessary appliances for illustrating the several subjects required. The mode of instruction is more specifically detailed in succeeding sections.

The courses in anatomy require several lecture rooms, which contain models, skeletons, and bones of all kinds, and a thoroughly sanitary dissecting room equipped with all of the latest materials necessary to give a course in anatomy second to none on the continent. The dissecting materials are furnished by the department free of charge.

For work in histology and pathology the department is exceedingly well provided. It has over thirty large microscopes, equipped with both high and low power, and several oil immersion objectives, microtomes, the best reflectoscope and projectoscope obtainable, besides a large assortment of histological and pathological slides, materials, and specimens for use in demonstration work in class and laboratory.

The equipment for instruction in physiology is ample to give the student a thoroughly comprehensive course of laboratory study.

For the study of materia medica and pharmacy there is a general pharmacy laboratory containing all the drugs used in the practice of veterinary medicine, and a practicing pharmacy where medicines are compounded for the every-day practice connected with the College.

For instruction in surgery and clinic the equipment is excellent. The surgical amphitheater is an annex to the main Veterinary Building, seating over three hundred people, and equipped with every modern appliance



for performing before the classes the most delicate operations upon both large and small animals. The hospital has a capacity of about thirty animals and is nearly always filled with patients, which gives ample material for the study of internal medicine as well. The out-clinic furnishes several thousand cases yearly, giving the student opportunity to become familiar with the diseases and their treatment under the guidance of proficient practitioners.

The policy adhered to in the instruction in all the departments is that the science of veterinary medicine is the foundation, and the art merely supplementary. A thorough drill is given in the foundation studies, and later in the course practical application of these is made in actual field work. This results in a thoroughly scientific veterinary education.

### COURSES IN ANATOMY

A few years ago there was inaugurated an entirely different method of anatomical instruction, hitherto untried in any school of human or veterinary medicine, and its success was so marked that it has become a permanent feature of the teaching of the department. Anatomy I, including dissection, takes up the bones of the trunk, *i. e.*, the vertebræ, ribs, sternum, and pelvis. The ligaments which hold these bones together are next considered, and are followed immediately by a study of the muscles of the trunk, which inclose the abdominal and thoracic cavities. The student is now ready to fill in and locate properly, and to study thoroughly, the important organs in these two body cavities. This work is immediately followed by the study of the blood supply of these organs, and this in turn by the study of the nerve supply controlling them, including that of the spinal cord, the vessels and nerves being carried to their point of exit from the trunk.

After the completion of Anatomy I of this course, the student has actually seen and dissected every essential organ in its gross anatomy, and to some extent in its microscopic. He is now thoroughly prepared for the study of histology, after which follows physiology, or the functional study of organs, and the details of their cell structure.

The limbs, the main functions of which are locomotion, are, together with the head and neck, usually in need of surgical rather than of medicinal treatment in veterinary practice. The practitioner, therefore, requires an extremely accurate knowledge of these parts, and when this anatomical study is brought closer in point of time to the study of surgery concerned, its practical application emphasizes the essential facts most effectively. By mutual consent, the dissection by one class occurs every morning at seven o'clock, thus giving higher classmen who desire to specialize in anatomy an opportunity to review the work, and to demonstrate by working with and by assisting the under classmen.

Before dissecting the ligaments and muscles of any part, the student is required to study them upon a mounted skeleton, thus ascertaining the exact points at which they attach to the bones. He then goes over the same muscles and ligaments on the Azoux model, afterwards dissecting them and proving the facts already learned, thereby acquiring a perfect mental picture of the animal body.

In Anatomy I, II, III, and IV each student is required to pass one perfect examination upon the origins and insertions of all the equine muscles of the part dissected, and he is marked, not upon the degree of perfection of the examination, but upon whether perfection was accomplished in the first, second, third, or fourth trial. He must also give a satisfactory tree outline of the circulatory and nervous systems, showing their distribution and branches, and their relationships. A satisfactory knowledge of the nerve supply of each muscle and of each cutaneous area is required.

In the winter term of the freshman year the class is divided into two equal sections, one half studying the anterior limb, in Anatomy II, and the other half studying the posterior limb, in Anatomy III, while the reverse arrangement is followed in the spring term.

The dissecting room is situated in the basement of the Veterinary Building, and possesses the best of sanitary and other equipment. The instruction in the classroom consists of quizzes, recitations, special dissections of the part under discussion, and a study of the Azoux model of the horse. Mounted skeletons and limbs and loose bones are abundant in the museum.

The subjects for dissection are preserved by the injection of a formaldehyde solution, followed by a red-starch solution that hardens within and fills the arteries. The veins are similarly treated with a bluish medium. The subjects are further preserved by immersion in a large concrete tank containing 15,000 pounds of solution specially prepared for this purpose. McFadgear's *Osteology and Anatomy of the Horse* is required in Anatomy I, II, III, and IV; Sisson's *Veterinary Anatomy* is required in addition in Anatomy V and VI, but those students who can afford it are urged to purchase both at the beginning of the course.

1.—ANATOMY I. Freshman year, fall term. Class work, one hour; dissection, eleven hours. Six and one-half credits. Required in the course in veterinary medicine; elective in other courses.

The course consists of supplemental lectures, demonstrations, and quizzes upon the bones, ligaments, and muscles; splanchnology, angiology, and neurology of the trunk, including the introductory work to each of these divisions of systematic anatomy. Textbook, *Osteology and Anatomy of the Horse*, by McFadgear.

2.—ANATOMY II. Freshman year, winter term. Class work, one hour; dissection, eleven hours. Six and one-half credits. Required in the course in veterinary medicine; elective in other courses.

The course deals first with the osteology, then with the musculature of the head and neck, after which are considered the angiology and the neurology of these parts, including the brain.

*Dissection.*—The course includes a very thorough laboratory study of the bones of the head, collectively and individually, special reference being given to the teeth, sinuses, cavities, and foramina. The cephalic muscles, the pharynx, the guttural pouches, the ear, the eye and the tongue are then dissected, together with the brain.

3.—ANATOMY III. Freshman year, spring term. Class work, one hour; dissection, six hours. Four credits. Required in the course in veterinary medicine; elective in other courses.

This comprises a review of Anatomy I, and lectures, demonstrations and quizzes upon the bones, ligaments, myology, neurology and angiology of the anterior limb, including the foot, with the exception of the digital vessels.

4.—ANATOMY IV. Sophomore year, fall term. Class work, one hour; dissection, six hours. Four credits. Required in the course in veterinary medicine; elective in other courses.

Both the class work and the dissection deal with the posterior limb in a manner exactly like the method employed in Anatomy II, but include the study of the circulation of the foot.

5.—ANATOMY V. Sophomore year, winter term. Class work, one hour; dissection, six hours. Four credits. Required in the course in veterinary medicine. Prerequisites: Anatomy I, II, III, and IV.

A correlative review of the entire subject is given, taking successively the bones, the ligaments, the muscles, the viscera, the blood vessels and the nerves in their entirety, and in the order here specified. The locomotor, respiratory, digestive, urinary and reproductive systems are then dealt with in such a manner as to build up a mental image of each structure in the student's mind.

*Dissection.*—In the dissecting room each division of systematic anatomy is taken up as a whole, each subject for dissection being preceded by regional and flap dissections of the principal operative areas, and by the isolation of the structures to be operated upon. The work also includes a mapping out in crayon of the important structures beneath the skin of a dark-colored horse. Textbook, *Veterinary Anatomy*, by Sisson.

6.—ANATOMY VI. Sophomore year, spring term. Class work, one hour; dissection, four hours. Three credits. Required in the course in veterinary medicine.

This course consists of a comparative study, accompanied by work in dissection, of the principal structural differences in the ox, sheep, hog, dog, and chicken, upon the basis of the facts learned concerning the horse in Anatomy I, II, III, IV, and V, which are prerequisites.

7.—ANATOMY. Sophomore year, fall term. Ten hours laboratory. Five credits. Required fall term, sophomore, agricultural courses.

The course is planned to give the agricultural students a general idea of the anatomy of farm animals, together with comparative references to many structures of the human body that are usually omitted in their general education. The course aims to aid them in understanding conformations by means of the study and dissection of the structures beneath the skin that modify it, at the same time observing the muscles of locomotion and the various levers, both as regards speed and power or draughting. Special attention is given to a thorough study of the foot, to enable the student to understand its care and shoeing. Considerable time is given to the digestive organs, to give the student a clear conception of the known physiologico-anatomical phases of feeding, digestion, nutrition, and metabolism. Text and laboratory guide, *Osteology and Anatomy of the Horse*, by McFadgear.

## COURSES IN HISTOLOGY

Lectures and recitations cover the work, which is done in the laboratory. During the lectures the projectoscope is used to illustrate the tissues studied. It is essential that the student obtain a thorough knowledge of the manipulation of the microscope, of the microscopical structure of the normal animal tissues, and of the methods of fixing, embedding, sectioning, staining and mounting tissues. This work gives the foundation for the study of pathological histology. Each student must prepare a full set of slides, from which he makes high- and low-power drawings.

8.—HISTOLOGY I. Freshman year, winter term. Class work, two hours; laboratory, four hours. Four credits. Required in the course in veterinary medicine, elective in the course in general science. Prerequisite: Anatomy I.

The first part of the term is spent upon the care and manipulation of the microscope, in the use of which the student must become proficient. This is followed by a microscopical examination of cotton, woolen, silk and linen fibers, bubbles of air, and drops of oil, to enable the student to recognize these when they are accidentally mounted with the tissue. The fundamental tissues are next studied: epithelial tissue with regard to form, structure, arrangement and location; connective tissue with regard to structure and location, including bone development and teeth and their development; muscular tissue, voluntary, involuntary, and cardiac; nerve tissue, the structures and forms of its cells, of medullated and nonmedullated nerve fibers; spinal cord; the blood vessels, heart, and lymphatic vessels. Blood corpuscles are studied with regard to size, shape, and structure, including each kind of white corpuscles; and the method of detecting blood by examination for hæmin crystals is shown. In this term the student studies and mounts sixty-five slides, some of which are teased, and many of which are sectioned in paraffin and celloidin. Textbook, *Histology*, by Stohr.

9.—HISTOLOGY II. Freshman year, spring term. Class work, two hours; laboratory, four hours. Four credits. Required in the course in veterinary medicine; elective in the course in general science.

This is a continuation of Histology I, beginning with the blood-forming organs, as bone-marrow, lymph glands, and spleen. The histology of the digestive tract is next studied, including a study of the mouth, the tongue, the taste buds, the parotid, the submaxillary and sublingual, the thyroid and thymus glands; the œsophagus; the stomachs of the dog, the horse and the ox; the small intestines—duodenum, jejunum, and ileum; the large intestines—cæcum, colon, rectum, and anus. During this term the student stains, mounts, studies with the microscope and makes drawings of the above-mentioned tissues. Some of the tissues studied are injected with gelatin mass to bring out the blood vessels. Textbook, *Histology*, by Stohr.

10.—HISTOLOGY III. Sophomore year, fall term. Class work, two hours; laboratory, four hours. Four credits. Required in the course in veterinary medicine; elective in the course in general science.

This is a continuation of Histology II, and includes the microscopic study of the liver, the pancreas, the respiratory tract—nasal mucous membrane, larynx, trachea, lungs, and bronchi; the urinary organs—kidney, ureter, bladder, urethra; the male and female genital organs; the skin and its appendages; the suprarenal gland; the medulla; the cerebellum; the cerebrum; the eye; and the ear. In this course the student prepares thirty slides. Textbook, *Histology*, by Stohr.

## COURSES IN PHYSIOLOGY

The courses in physiology are divided into Comparative Physiology, Animal Physiology, and Human Physiology.

11.—COMPARATIVE PHYSIOLOGY I. Sophomore year, winter term. Class work, five hours; laboratory, four hours. Seven credits. Required in the course of veterinary medicine; elective in the course in general science. Prerequisites: Anatomy I; Chemistry I, II, III; Histology I and II.

This course treats of the physiology of domestic animals, beginning with the study of the blood, heart, blood vessels, and continuing with the ductless glands and internal secretions, respiration, digestion, and absorption. Textbook, *A Manual of Veterinary Physiology*, by Fred Smith.

**Laboratory.**—The laboratory work consists of a practical application of the knowledge derived in the classroom. The laboratory is equipped with all necessary material and apparatus to make a detailed study of the composition and digestive action of the saliva, gastric juice, bile, pancreatic and intestinal juices. Hormones and other substances in relation to their influence upon the production and action of the digestive juices are also considered. The composition and properties of the blood are studied by the aid of chemical, microscopic and spectroscopic methods. Textbook, Halliburton's *Essentials of Chemical Physiology*.

12.—COMPARATIVE PHYSIOLOGY II. Sophomore year, spring term. Class work, five hours; laboratory, four hours. Seven hours credit. Required in the course of veterinary medicine; elective in the course in general science.

The work of this term is a continuation of Comparative Physiology I, and treats of the urine and urinary system, nutrition, animal heat, muscular and nervous symptoms, locomotion, generation and development, growth and decay. Textbook, Smith's *A Manual of Veterinary Physiology*.

**Laboratory.**—The laboratory work consists of a study of the normal urine, determining the composition, quantitatively as well as qualitatively. Tests for the detection of abnormal constituents, such as bile, blood-sugar and albumen, are applied to normal and also to pathological urine. Microscopic examination is made for blood casts, blood, etc. The laboratory work in practical physiology consists in studying the phenomena associated with the nervous, muscular, respiratory and circulatory systems, and making graphic records of the same. Textbooks, *Urine of the Horse and Man*, by Fish; *Practical Physiology*, by Hemmeter.

13.—HUMAN PHYSIOLOGY. Sophomore year, spring term. Class work, four hours. Four credits. Required in the course in home economics; elective in the course in general science. Prerequisites: Chemistry I, II, III; Elementary Organic Chemistry.

The instruction consists of a study of the composition of the bones, blood, lymph, and all the secretions of the body, with their respective functions. The functions of the tissues and glands, the structure and functions of the digestive tract, of the respiratory tract, of the skin, of the nervous system and of the organs of special sense are all considered. The lecture room is equipped with skeletons, papier-mâché manikins, and models of the eye, ear, etc. Demonstrations relative to the subject under discussion are made as often as is practicable. Textbook, Martin's *Human Body*.

14.—CHEMICAL AND EXPERIMENTAL PHYSIOLOGY. Class work, two hours; laboratory, four hours. Four credits. Elective. Prerequisite: Human or Animal Physiology.

This course is intended to supplement the lectures in physiology, so that the student will make a practical application of the knowledge obtained in the classroom. It will embrace the study of the composition of the body tissues and of the secretions and excretions of the various glands; the various enzymes and their physiological relation to the digestion of the food substances; absorption, assimilation, and metabolism. The composition and properties of the blood will be studied by spectroscopic, microscopic and chemical methods. Graphic records of the blood pressure and of the pulse, as well as of the phenomena that attend the contraction of muscles, will be made. Text, Halliburton's *Essentials of Chemical Physiology*.

15.—ANIMAL PHYSIOLOGY. Sophomore year, winter term. Four hours. Required in the course in agriculture.

This course is intended to give the student a useful knowledge of the functions of the body of the various farm animals, so that he can realize and understand the benefits to be derived from the judicious application

of proper breeding, feeding and care of farm stock. The course includes the study of the composition and functions of the various digestive juices and the relation of the food to the production of heat, growth, and maintenance of health. The functions of the blood, respiratory, nervous and excretory systems are also carefully studied. Specimens, charts and various apparatus will be employed to demonstrate the facts presented during the lecture periods. Text, Fred Smith's *Manual of Veterinary Physiology*.

### PATHOLOGY

The laboratory is equipped with microscopes, microtomes, paraffin ovens, microphotographic and projection apparatus. Each student is furnished with a microscope, and locker containing staining dishes and stains. Material is furnished the student for embedding, sectioning and staining tissues for microscopic study. In addition, the student is furnished many mounted slides for study, which contain the pathological lesions to which the domestic animals are subject. In addition to this, the material from the post-mortem of animals and material sent to the College from over the State furnish ample material for laboratory diagnosis.

16.—PATHOLOGY I. Junior year, fall term. Class work, five hours; laboratory, four hours. Seven credits. Required in the course in veterinary medicine; elective in the course in general science. Prerequisites: Histology, Physiology, and Bacteriology I.

This course in general pathology treats of the history of pathology, predisposition, immunity, congenital and inherited disease; circulatory disturbances—cardiac difficulties, hyperæmia, hemorrhage, dropsy, œdema, thrombosis, embolism, and alteration of the blood; disturbances in metabolism—fever, necrosis, atrophy, cloudy swelling, fatty changes, inflammation, calcification, and concrement formation; and of the process of repair of tumors, and of functional disturbances. Text, *Comparative General Pathology*, by Kitt.

17.—PATHOLOGY II. Junior year, winter term. Class work, four hours; laboratory, six hours. Four credits. Required in the course in veterinary medicine; elective in the course in general science.

This course is devoted to pathological technique: collecting, fixing, hardening, embedding in celloidin and paraffin, sections of fresh, frozen, and embedded tissues; and a study of the method of preserving gross specimens. Considerable time is devoted to stains and the method of staining. This work is followed by special pathology, which includes the macroscopic and microscopic examination of the following tissues in all of the pathological conditions to which they are subject: cardiac muscle, skeletal muscle, the liver, the kidney, the bladder, the pancreas, the lungs, digestive tract, the serous membranes, the vascular system, lymph nodes, the spleen, bone, skin, and genital organs. The students stain, mount, study, and make drawings of the above-mentioned tissues. Textbook, *Pathological Histology*, by Gaylord and Aschoff.

18.—PATHOLOGY III. Junior year, spring term. Class work, four hours; laboratory, six hours. Seven credits. Required in the course in veterinary medicine; elective in the course in general science.

This course is devoted to the pathology of the infectious diseases and to laboratory diagnosis. Post-mortem examinations are made on all animals dying in the hospital at the College barns and in the neighborhood. The students attend and take turn in holding the autopsy. Each student is expected to keep a written report of the pathological changes, also of the microscopic findings. The above work is done under the direction of the pathologist in charge. Text, *Pathology of Infectious Diseases*, by Moore.

## MATERIA MEDICA

19.—MATERIA MEDICA I AND II. Junior year, fall and winter terms. Class work, four hours during the fall term, and two hours during the winter term.

The course includes definitions of terms, modes of action of drugs in general, their method and rapidity of absorption and elimination, physiological and chemical incompatibles, etc. The drugs and medicinal agents are grouped according to their action. The lecturer discusses the origin, physical properties, active constituents, and official preparations of the medicinal agents.

20.—THERAPEUTICS I AND II. Junior year, winter and spring terms. Class work, two hours winter term, and four hours spring term. Prerequisites: Materia Medica I and II.

The student is thoroughly drilled in the physiological action of the various drugs, or action on the healthy animal, and the therapeutic action, or action on the diseased animal. A course in toxicology is included in this work, taking up the symptoms and treatment of poisons frequently encountered in veterinary practice. The science of posology, or dosage, is considered of the utmost importance, and a liberal amount of time is devoted to it, taking up the proper dose of the crude drug and its preparation for the horse, cow, dog, cat, and swine. Reference works: Winslow's *Veterinary Materia Medica and Therapeutics*; *United States Dispensatory*; Wood's *Therapeutics, its Principles and Practice*.

21.—PHARMACY. Junior year, fall term. Class work, one hour; laboratory, four hours.

In the lectures the meanings of the various pharmaceutical terms are discussed. Various systems of weights and measures, and the conversion of one system into another, are taught. Official preparations and some unofficial ones, their strength and the mode of preparation of each, are studied in regular order. Particular stress is placed upon prescription writing, the student being taught to avoid incompatibilities, to give nouns the proper case ending, and to understand the meanings of certain Latin phrases. In the laboratory work the principles of filtration, percolation, hot-water and sand baths, etc., are taught. The student is required to prepare at least one of each of the following preparations: an infusion, a decoction, a tincture, a wine, a syrup, a fluid extract, a liniment, an emulsion, a liquor, an aqua, a spirit, a volus, an ointment, an electuary, and a cataplasm. In addition, a thorough course in the compounding of prescriptions is afforded at the clinic, where all medicines are prescribed and compounded by the students, under guidance of the instructor in charge. Reference works: *U. S. Pharmacopœia*; Maltbie's *Practical Pharmacy*; Remington's *Practice of Pharmacy*; Fish's *Exercises in Materia Medica and Pharmacy*.

## COURSES IN SURGERY

22.—SURGERY I. Junior year, fall term. Class work and laboratory, three hours.

This course includes methods of restraint; asepsis and antiseptics; anæsthesia, both local and general; inoculations, bandaging, massage, controlling hemorrhage; division of tissues and the uniting of wounds; injections of medicines into the subcutaneous tissues, blood stream, trachea, spinal canal.

23.—SURGERY II. Junior year, winter term. Class work and laboratory, three hours.

This course is a continuation of Surgery I. Animal dentistry is taken up very thoroughly, in so far as it constitutes an important part of the veterinarian's work. The students have free access to a large number of museum specimens of abnormal teeth. Also, many dental patients are presented at the College hospital for treatment.

24.—SURGERY III. Junior year, spring term. Class and laboratory, three hours.

This course considers in regular order the surgical diseases of the head, neck, thorax, abdomen, stomach and bowels, urinary organs, and organs of generation.

25.—SURGERY IV. Senior year, fall term. Class and laboratory, three hours.

During this course particular attention is paid to causes, symptoms and treatment of lameness. It considers in detail fractures and their reduction, diseases of joints, tendons and sheaths, muscles and fascia, and surgical diseases of the foot.

26.—SURGERY V. Senior year, winter term. Class and laboratory, three hours.

Surgery as taught during this course includes special surgical operations, such as neurectomies, autoplastics, desmotomies, actual cauterization, tenotomies, myotomies, enterectomy and enteroanastomosis, and surgery of the eye.

27.—SURGERY VI. Senior year, spring term. Class and laboratory, three hours.

This is a continuation of Surgery V. Reference books: Dollar's *Regional Veterinary Surgery*; Merillat's *Veterinary Surgery*, Vols. I, II, and III; Williams' *Surgical Operations*; Fleming's *Operative Veterinary Surgery*, Parts I and II; White's *Restraint of Domestic Animals*.

28.—OPERATIVE SURGERY I AND II. This is a laboratory course. Four hours a week, extending throughout the fall and winter terms of the senior year, are devoted to this work.

Old horses are purchased by the department, placed on the operating table, anesthetized, and over one hundred operations are performed on the animal. During this work the student is required to observe a careful technique, such as antiseptis, and, in fact, performs the operation as thoroughly and completely as possible. It is a very practical course and fits the student for surgical work in actual practice.

29.—HORSESHOEING. Two hours a week during the fall term of the senior year are devoted to this subject.

The course is taught by means of lectures, recitations and demonstrations, taking up the various divisions in the following order: normal conformation in both limb and foot, the anatomy of these parts, physiological movements and correct normal shoeing. This is followed by a study of the proper shoeing for the correction of wry limbs and feet; diseases of the feet, and the relation of horseshoeing thereto. The course ends with a study of the shoeing of mules and oxen. Throughout the entire course the purpose is to instill in the mind of the student normal shoeing, in order that he may be able to correct abnormalities in the foot and limb in so far as this can be accomplished by shoeing. Reference books: Lungwitz's *Textbook of Horseshoeing*; Dollar's *Handbook of Horseshoeing*.

## OBSTETRICS

30.—OBSTETRICS. This branch is taken up both by the laboratory and lecture method; two hours a week of the former and four hours a week of the latter during the full term of the senior year.

Physiological obstetrics opens the course, during which periods of œstrum and gestation, impregnation, ovulation, eutocia, etc., are discussed. This is followed by pathological obstetrics, devoted to diseases of the new-born and diseases incidental to pregnancy, sterility, dystocia, and surgical obstetrics. The latter phase of the work is greatly assisted by demonstrations, during the laboratory period, on an obstetrical phan-



tom and foetus; in addition, the College farm and surrounding agricultural territory furnish an abundance of actual material. Reference books: Williams' *Veterinary Obstetrics*; Williams' *Surgical and Obstetrical Operations*; De Bruin's *Bovine Obstetrics*; Fleming's *Veterinary Obstetrics*.

## CONFORMATION AND SOUNDNESS

31.—CONFORMATION AND SOUNDNESS OF THE HORSE. Two hours a week during the spring term of the senior year are given to this subject.

A lecture course, during which the desirable conformation of the horse, together with a description of all blemishes, defects, unsoundnesses, faults and vices are discussed. During clinics ample opportunity is afforded for demonstration on the living animal. Reference books: Goubaux and Barrier's *Exterior of the Horse*; Captain Hayes' *Points of the Horse*.

## COURSES IN MEDICINE

32.—DIAGNOSIS. Junior year, fall term. Class work, three hours.

This is a preparatory course to the study of medicine proper. It takes up in detail the different diagnostic methods employed for the detection of disease, including auscultation, percussion, palpation, and inspection, and also treats of the normal and abnormal abdominal and thoracic sounds, and considers in detail the specific examination of the various organs, including diagnostic inoculations as an aid to the detection of disease.

33.—MEDICINE I. Junior year, winter term. Class work, three hours.

A study of the noninfectious diseases of the respiratory organs, taking up in regular order the nasal and accessory cavities, the larynx, bronchi, lungs, and pleura.

34.—MEDICINE II. Junior year, spring term. Class work, three hours.

Devoted to noninfectious diseases of the mouth, salivary glands, oesophagus, stomach and intestines, liver, pancreas, and peritoneum. This is followed by diseases of the urinary organs, of the circulatory organs, and diseases of metabolism.

35.—MEDICINE III. Senior year, fall term. Class work, three hours.

This course treats the noninfectious diseases of the nervous system, of the organs of locomotion, and of the skin.

36.—INFECTIOUS DISEASES. Senior year, winter term. Class work, four hours.

In contradistinction to the preceding courses in medicine, the distinctly infectious and contagious diseases of domesticated animals are discussed. The following order is usually adopted: acute general infectious diseases, acute exanthematous infectious diseases, acute infectious diseases with localization in certain organs, infectious diseases with special involvement of the nervous system, chronic infectious diseases, infectious diseases produced by protozoa.

37.—SANITARY MEDICINE. Senior year, spring term. Class work, four hours.

A continuation of the course in infectious diseases, in which particular attention is given to propagation and spread of infectious diseases, predisposing and exciting causes of disease, general sanitation, etc.

38.—OPHTHALMOLOGY. It discusses the method of conducting examinations of the eye by means of the ophthalmoscope, illumination of the eye, and the use of drugs as an aid to this process; and acute and chronic diseases of the eye.

Reference books for the courses in medicine: Hutyra and Marek's *Pathology of the Diseases of Domestic Animals*, Vols. I and II; Friedberger and Frohner's *Veterinary Pathology*, Vols. I and II; Law's *Veterinary Medicine*, Vols. I, II, III, IV, and V; Moussu and Dollar's *Diseases of Cattle*; Class' *Diseases of the Dog*; Cadiot's *Clinical Veterinary Medicine*.

39.—JURISPRUDENCE. Senior year, spring term. Class work, two hours.

This course deals with the veterinarian's legal responsibilities, national and state live-stock laws, quarantine regulations, etc.

## CLINICS

40.—CLINICS. Junior and senior years, twelve hours or more.

A free clinic which affords an abundance of material is conducted. All species of domesticated animals are presented for treatment. These patients are assigned in regular order to the senior students for diagnosis and treatment; clinic sheets are provided, on which are recorded the history, symptoms, pulse, temperature, respiration, diagnosis, prognosis, treatment, and the unsoundnesses, defects or blemishes of the animal. The clinician in charge discusses all the abnormal conditions present in the patient, thus assisting the student to develop his powers of observation. The junior students assist the senior students and, in addition, are required to master, by practical experience, the restraint of animals, bandaging, etc. The compounding of prescriptions, the preparation of antiseptics and other medicinal agents, is taken in charge by the junior students.

Patients left at the hospital for treatment are assigned to seniors, who are required to administer all medicines, change dressings of surgical wounds, etc. All work is performed under the direct supervision of the clinician in charge. Numerous country calls are received by the veterinary department, which are taken care of by one of the clinicians, and who is always accompanied by one or more senior students. This phase of the work is particularly valuable, as it gives the student practical experience under actual conditions.

41.—MEAT INSPECTION. Senior year, spring term. Class work, four hours. Four credits. Required in the course in veterinary medicine.

The course in meat inspection is designed to prepare experts for national, state and local sanitary work, which is being more strongly urged and demanded every day. The kinds and classes of stock, the traffic and transportation of animals, their inspection before death, their slaughter, the normal conditions of healthy animals, the diseases discernible at the time of slaughter, the disposition of the condemned from economic, hygienic and sanitary standpoints, and different preparations and methods of preservation, adulterations, sanitary laws and regulations, and all other points bearing upon the question of healthful meat production, are considered. Visits are made to the local slaughtering establishments, and to the large packing plants in Topeka, Kansas City, or Wichita. Text, Edelman's *Meat Hygiene*, translated by Mohler and Eichorn.

42.—DISEASES OF FARM ANIMALS, AND OBSTETRICS. Senior year, spring term. Class work, four hours. Four credits. Required in the courses in animal husbandry and dairy husbandry. Prerequisites: General Anatomy I and Animal Physiology.

This course is devoted to the study of the common diseases of farm animals and to obstetrics. The subjects discussed include wounds and their treatment, examining farm animals for disease, the diagnosis and treatment of disease, the causes and treatment of contagious diseases. Sanitary and other measures necessary for their eradication and prevention are also studied. The instruction in obstetrics embraces a com-

parison of the soft and bony structures of the pelvis in the different animals, the comparison being made with reference to normal and difficult parturition. The causes of sterility are discussed, and the necessary remedies suggested. Attention is given to the accidents and diseases incidental to normal and difficult parturition. The diseases following parturition and the diseases affecting the offspring are also dealt with. Text, *The Farmer's Veterinarian*, by Burkett.

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## Short Winter Courses in Agriculture and Dairying

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The Agricultural College offers primarily four-year courses in agriculture, which give the student a fundamental training in the sciences relating to agriculture, and their application to the production of crops and stock and to farming in general. Such a course not only equips a man to become a successful farmer, but makes of him a better citizen, and a leader in the broader duties of life.

Not all young men who choose to farm have the time or the means to spend the necessary four years in getting a college training. For such who are at least eighteen years of age, the Agricultural College offers a short, practical course in agriculture and dairying, given in two terms. The entire time of the student is occupied in learning how to do the various things which are necessary for the production of good crops and good stock, and for the business management of the farm. The subjects taught in such a course cover as much as can be given in the time, and are made intensely practical in presentation. The student is taught *why* and *how* to do the various farm operations.

### DESCRIPTION OF SHORT COURSES

#### AGRICULTURE AND DAIRYING

The student may select either agriculture or dairying, or a combination of the two, as may best suit his individual needs. All students are required to take crop production, live-stock production, poultry, and wood-work the first year, and breeding and feeding of live stock, live-stock sanitation, agricultural botany, soil physics, and blacksmithing the second year. Other subjects offered are elective, enough being taken to make up a full course of fifteen hours of class work and twenty-eight hours of laboratory work a week.

The work in crop production and live-stock production gives a knowledge of these subjects in a practical way. The student who has not taken scientific work is not able to study them from the standpoint of one trained in chemistry, physics, zoölogy, etc., but can get from his study in class and laboratory the art of doing these things properly. The same is true of dairying and horticulture. The farmer needs to know how to select stock and crops that will be best adapted to his environment, and the short courses train him to do this. He needs to know how to prepare his soil for the reception of the seed; or so to manage his feed as to make the greatest gains in feeding his live stock. These things are taught successfully to short-course students.

Farm mechanics, as it relates to general farming or dairying and to practice in woodwork, is taught in such a way as to make the student capable of handling tools and machinery with proper skill.

The students who return for the second winter's work are given more advanced work along the same lines that were studied the first year.

The problems of breeding and feeding, diseases of live stock, soil and crop management, and the building up of pure-bred herds, are studied from the standpoints of the purchaser, the breeder, and the farmer.

### Farmers' Short Course

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

FIRST YEAR	SECOND YEAR	SECOND YEAR (Continued)
Crop Production 6 (4-4)	Animal Breeding 3 (3-0)	Dairying II 4 (4-0) <i>or</i>
Live Stock Market Classes 3 (1-4)	Breeds 3 (1-4)	Horticulture 3 (3-0)
Live Stock Feeding 3 (3-0)	Farm Management 2 (2-0)	Farm Insects 2 (2-0)
Horticulture and Forestry 6 (4-4)	Live Stock Sanitation 3 (3-0) <i>or</i>	Blacksmithing 2 (0-4)
Dairying I and Poultry 6 (4-4)	Gas Engines 3 (1-4)	Dairy Stock Judging 2 (0-4) <i>or</i>
Farm Mechanics 1 (0-2)	Crop Improvement 5 (3-4)	Horticulture Laboratory 2 (0-4)
Woodwork 2 (0-4)	Agricultural Botany 2 (0-4)	
	Soils 2 (0-4)	

### Creamery Course

This course is offered for young men who wish to become butter or cheese makers, or handlers of market milk and ice cream.

It is a technical course. Certificates are issued to students who have completed the course in a satisfactory manner and have a report of six months' successful work in a creamery.

The subjects taught are as follows:

Butter Making and Creamery Management 8 (4-8)
Cheese and Ice Cream Making 4 (1-6)
Dairying I 6 (4-4)
Dairy Mechanics and Refrigeration 1 (0-2)
Dairy Bacteriology 4 (2-4)
Judging Dairy Products 2 (0-4)
Dairy Stock Judging 2 (0-4)

## SUBJECTS TAUGHT IN THE SHORT COURSES

## AGRONOMY

1.—CROP PRODUCTION. Class work, four hours; laboratory, four hours. Six credits. Required in the first year of the farmers' short course.

In this course such questions as time, depth, and manner of plowing; seed-bed preparation; time, rate, and method of seeding the various crops; crop rotation and cultivation, and farm soils are taken up in turn and discussed in a practical way.

*Laboratory.*—Special attention is given to the grain crops grown in this State. Various types of different varieties of corn, wheat, oats, etc., are available for comparative study. The student has the opportunity to handle and examine specimens of the common crops of this State—the best possible method for becoming familiar with the different plants.

2.—FARM MECHANICS. Laboratory, two hours. One credit.

This is a new but very important line of work. There is probably a greater waste on farms from lack of knowledge of the kind of machinery to use, and of the way to care for it, than from any other cause. Mechanics in some form is required in practically every operation performed on the farm. The purpose of this course is to acquaint the student with the important improvements in farm machinery and to give him a general idea of the proper care, adjustment, and use of all farm equipments, as well as a general idea of the factors concerned in the construction of farm buildings, etc. This work is given in the form of illustrated lectures and laboratory demonstrations.

3.—CROP IMPROVEMENT. Class work, three hours; laboratory, four hours. Five credits.

The object of this course is to present practical, up-to-date, and approved methods of improving farm crops. Such questions as seed selection, crop adaptation, and crop rotation are presented and discussed in a practical manner.

4.—SOILS. Laboratory, four hours. Two credits. Required in the second year of the short course.

This course consists of a study of methods of handling soils; it teaches how to prepare a suitable seed-bed, how to conserve moisture, and how to maintain fertility. A part of the period is used for lectures and demonstrations.

5.—FARM MANAGEMENT. Class work, two hours. Two credits.

The object of this course is to assist the student in applying to the management of a farm the information gained from his studies in the various agricultural courses. The work in animal husbandry, dairying, horticulture, agronomy, and other lines is correlated and placed on a practicable, workable basis, with all nonessential features eliminated. The farm lay-out is studied with especial reference to the character of the soil, its adaptation to certain kinds of crops and types of farming; the location of the buildings, their adaptation to types of farming; the proper distribution of capital among land, buildings, live stock, farm machinery, etc.; the division of the farm into fields of the proper size and shape for economical working; the planning and utilization of crops in rotation with one another; the relation of live stock to the maintenance of soil fertility; the proper adjustment of labor, teams, machinery, etc., to the farming area; and the growing of the right kind of crops in the proper proportion on farms of different types.

## HORTICULTURE

1.—HORTICULTURE AND FORESTRY. Class work, four hours; laboratory, four hours. Six credits.

Lectures are given on the principles upon which successful work in gardening and fruit growing depends. Here is given a discussion of the preparation of the soil, the use of fertilizers, the propagation and manipulation of plants, and the gathering and marketing of garden and orchard products. The twelve lectures on forestry here included cover in detail the formation of windbreaks and farm wood-lots, discuss the trees suitable for planting in the different parts of the State, and describe methods of planting and the care and cultivation required for securing successful growth.

*Laboratory.*—Two periods are used in investigating plant propagation, plant training, and plant protection. The other two periods are spent in inspecting the forest nursery and timber plantations.

2.—HORTICULTURE. Class work, three hours. Three credits.

The work of this course is somewhat similar to the horticultural work described in the preceding course. A short discussion of the landscape principles and materials concerned in the improvement of farm properties is included.

3.—HORTICULTURE LABORATORY. Four hours. Two credits.

This includes a study of orchard sites, and of grades of nursery stock and its care; tests of orchard tools, of fuels and heaters for frost protection; a study of orchard sanitation, fruit picking, packing, judging, and storage.

## ANIMAL HUSBANDRY

1.—LIVE-STOCK MARKET CLASSES. Class work, one hour; laboratory, four hours. Three credits.

One lecture a week is given on the various market classes of live stock, taking up the study of the various market requirements for producing fat as well as for feeding cattle, the different types and classes of horses, sheep, and hogs. The aim of this work is to make the student familiar with the classifications found in the leading live-stock markets, and to enable him better to judge the various breeds of stock on the farm.

*Laboratory.*—The principal work is the judging of cattle, sheep, and hogs. The student is first taught the use of the score-card, and, after becoming familiar with this, is required to use comparison and group judging, the aim being to make him familiar with the best types of horses, and able both to detect unsoundness and to select such classes of stock as will give the best returns. During the last two weeks of the course the instruction in stock judging takes up dairy cattle. This is an elementary course in dairy-stock judging, and consists of scoring and judging animals by the use of the score cards.

2.—LIVE-STOCK FEEDING. Class work, three hours. Three credits.

This is a study of all the common feedstuffs grown on the average farm, of the use of mill feeds and by-products, of the combinations of feeds that will give the best results, and of the feeds that can be most economically used under various conditions.

3.—ANIMAL BREEDING. Class work, three hours. Three credits.

This subject is intended to give the student a knowledge of underlying principles and practices which are concerned in the improvement of our domestic animals. A careful study is made of the subject of variation in general. The subject of transmission of characters and the behavior of the various characters in transmission is taken up. The subject also includes correlation, type, and variability. Study is made of Mendel's law of hybrids. Prepotency of animals is studied as an influence in heredity. Practical problems involving the selection of animals and

various systems of breeding, such as crossing, hybridizing, grading, line breeding, and inbreeding, are discussed. The student is shown how to maintain and to improve his own flocks and herds by the application of these various fundamental principles of breeding.

4.—BREEDS. Class work, one hour; laboratory, four hours. Three credits.

A study is made of the origin and history of the various breeds of domestic animals, of the characteristics of each breed, and of their adaptability to various conditions.

*Laboratory.*—This work consists in the judging of pure-bred classes of stock. The characteristics of each breed, its weaknesses and its strong points, are emphasized, in order that the student may be better able to select his breeding herd. During the last two weeks of the course in breeds of live stock, the principal breeds of dairy cattle are studied, and types of each breed are judged and scored. For those students who elect dairying, or who desire to take more work in judging and studying dairy breeds, a special course is offered. In this course is given the history of breeds, their dairy characteristics, with the study of advanced registry systems and pedigree work with each breed.

5.—LIVE-STOCK SANITATION. Class work, three hours. Three credits.

This subject deals with diseases that are communicable from animal to animal or from animal to man. The causes, symptoms, and methods that are employed to prevent and to combat the spread of diseases, and the drugs that are commonly used as disinfectants, for washes, dips, etc., are given full consideration. The use of serums, vaccines, etc., for the prevention of diseases is considered. Methods of disposal of sick and dead animals, as well as the means employed to clean and to disinfect the premises so as to prevent a recurrence of diseases, are considered.

#### DAIRY HUSBANDRY

1.—DAIRYING I. Class work, four hours; laboratory, four hours. Six credits.

This is a general course in dairying, and consists of lectures on the secretion, composition, and properties of milk; the effect of the period of lactation; the Babcock test; the farm separator; farm butter making; and dairy sanitation. Lectures describe the handling of milk, feeding the dairy cow, and selecting and breeding the dairy herd. During the last two weeks the lectures deal with Poultry, which work is described elsewhere.

*Laboratory.*—The laboratory work in this course consists of the operation of the Babcock test with milk, skimmed milk, cream, etc.; of practice with farm separators; and of farm butter making.

2.—DAIRYING II. Class work, four hours. Four credits.

This course is planned for those students who elect dairying during the second year. Instruction is given in keeping records and accounts of dairy-farm business; in building up a dairy herd; concerning buildings on a dairy farm; concerning silos and silage; on the fertility account of the dairy; on the feeding, care, and management of the dairy herd; on cow-testing associations, the coöperative ownership of dairy sires, and the making of detailed plans for the management of the dairy farm.

3.—DAIRY STOCK JUDGING. Laboratory, four hours. Two credits.

This course deals with judging dairy cattle from the standpoint of breed type. Practice is given in scoring animals with the breed score-cards, with comparative judging of the principal breeds.

4.—BUTTER MAKING AND CREAMERY MANAGEMENT. Class work, four hours; laboratory, eight hours. Eight credits. Lectures are given on the

sampling, weighing, and grading of cream and milk; on natural and commercial starters; on the pasteurization of milk and cream; on cream ripening, and the churning, washing, salting, packing, and marketing of butter; on conditions controlling the per cent of moisture in butter, etc. This course includes also a study of the location, construction, equipment, and general arrangement of the creamery; of the organization of co-operative creameries, etc.; of the question of supplies for the creamery markets; of the keeping of accounts; of the making up of pay rolls and systems of payment; of the building up of cream routes; of the relation of creamery and buyers to the patrons; of the relation of patrons to the creamery.

*Laboratory.*—The laboratory work comprises practice in sampling, weighing, and grading milk and cream and in churning, packing, and marketing butter; the study of different makes of churns; the pasteurization of cream and practice with starters.

5.—CHEESE AND ICE-CREAM MAKING. Class work, one hour; laboratory, six hours. Four credits.

This course deals with the making of cheese on the farm for home use and for sale. All the common types of cheese are made. The last half of the term is devoted to the study of ice-cream making, including proportion of cream, flavoring, fillers, freezing, packing, and storing ice cream.

*Laboratory.*—Practice is given in the making of cheese, ice cream, and ices, for home use and on a commercial scale. The student judges cheese and prepares cream; flavors, freezes, and packs ice cream.

6.—DAIRY MECHANICS AND REFRIGERATION. Laboratory, two hours. One credit. Required in the creamery course.

Practice work is given in pipe fitting, belt lacing, the adjustment of pulleys, soldering, refrigeration, installation and management of machinery, etc.

7.—JUDGING DAIRY PRODUCTS. Laboratory, four hours. Two credits. The work comprises scoring and judging butter, cheese, milk, and ice cream.

#### ADDITIONAL COURSES

1.—POULTRY. Class work, four hours a week for two weeks. Given in connection with Dairying I; for the combined work, six credits.

The first part of the course is devoted to a study of farm poultry. The subjects—breeding, feeding, fattening, and marketing poultry; hatching and rearing chicks; construction of poultry houses; and methods of combating disease—are taken up in detail. The remainder of the time is given to a study of the different breeds from the fancy and from the utility standpoints.

2.—WOODWORK. Shop work, four hours. Two credits.

A graded set of problems in joinery is given, with opportunity for practice in working to dimensions and in the proper use and care of bench tools. Tool required: a two-foot pocket folding rule.

3.—BLACKSMITHING. Shop work, four hours. Two credits.

This is a course in the forging of iron, designed to teach the operations of drawing, upsetting, welding, twisting, splitting, and punching. A study is made of the construction, care, and management of the forge, with a study of the smelting of iron ore and the manufacturing of iron and steel. Tools required: a two-foot rule; one pair of five-inch outside calipers.

4.—GAS ENGINES. Class work, one hour; laboratory, four hours. Three credits.

This course is designed to teach the operation, care and repair of small stationary gas and oil engines.



5.—AGRICULTURAL BOTANY. Laboratory, four hours. Two credits.

This is a study of the elements of botany from a practical standpoint. Germination, growth, the nutrition of plants, the absorption and use of water, etc., are demonstrated by means of elementary experiments. The groups of the lower plants are rapidly surveyed, especial attention being paid to the fungi causing plant diseases. Chief attention is given to the botany of the higher plants, notably those most important in agriculture. The economic relations of plants are emphasized throughout, and the practical bearings of plant physiology on agriculture are especially considered. Some time is given to the matter of seed testing, and to the study of elementary methods in plant breeding. Text, Perceval's *Agricultural Botany*.

6.—FARM INSECTS. Class work, two hours. Two credits.

In this course the student is familiarized with the recognition marks, life history, and specific means of controlling the most injurious of the insects commonly found on the farm. He is required to prepare plans of actual farming operations on different types of farms whereby insect damage to the crops will be reduced to a minimum or completely eliminated.

7.—DAIRY BACTERIOLOGY. Class work, two hours; laboratory, four hours. Four credits. Required in the Creamery Short Course.

This course is designed for students who have had no training in chemistry and biology and is a general study of the bacteriology of milk and milk products. Bacterial contaminations of milk from air, water, utensils, the cow, the milker, etc., are discussed. Normal and abnormal fermentations, their significance and control in milk, butter, cheese, and special dairy products are considered.

*Laboratory.*—Methods for determining numbers and types of bacteria in dairy products are studied. The effect of sanitation, the use of heat and cold, etc., upon the development of bacteria are considered.

#### COURSE IN TESTING DAIRY PRODUCTS

This course is offered to those who are buying milk or cream and who wish to gain, in a short time, skill and accuracy in the application of the various tests necessary in such work. The law of the State requires that all persons buying milk or cream by test must pass a satisfactory examination and secure a certificate from the State Dairy Commissioner. This course is designed to meet the needs of those who find they have not sufficient knowledge of the subject to pass such an examination.

In addition to a study of the Babcock test, the student receives lectures on ordinary sanitation, and learns the methods necessary to keep his place of business in a sanitary condition. Exercises are given in grading milk and cream, and in methods of handling cream so as to keep it in condition until used or delivered at the railway station. This course is offered at different periods throughout the year, dates being announced a few days previous to the opening of each period.

#### REQUIREMENTS FOR ADMISSION

Students over seventeen years of age are admitted to these courses without examination. Students under seventeen years of age are admitted without examination, provided they present a certificate showing that they have completed the eighth grade in the common-school course, or its equivalent.

All students entering short courses are required to be present at the beginning of the term, and will not be admitted later.

*Certificate.*—A certificate is granted to students completing the work of the first and second years.

*Cost.*—The expenses for ten weeks need not exceed \$50 to \$75, exclusive of railroad fare. A fee of \$3 is charged for the term, payable at enrollment. Reference books will cost from \$5 to \$10. For information write W. M. Jardine, Dean of the Division of Agriculture, Kansas State Agricultural College, Manhattan, Kan.

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### **Agriculture in the Summer School**

At the present time the greatest hindrance to the general introduction of agriculture into the high schools and grade schools of the State is a lack of properly prepared teachers. In order to give the teachers of the State an opportunity to fit themselves to introduce this subject successfully into their schools, the College offers summer courses in agriculture, in which especial emphasis is laid upon the subject matter and methods adapted to secondary and primary schools.

The work offered consists in part of some of the regular subjects of the College courses, including a thorough study of farm crops, especially corn and small grains, in which growing as well as matured crops are available for laboratory work. Courses are also available in the study of market types and classes of beef cattle, dairy stock, sheep and swine, with extensive practice in stock judging. Instruction is also given in dairying, poultry husbandry, general horticulture, landscape gardening, and orcharding. In addition to these subjects from the College courses, special classes are organized to meet the needs of teachers of agriculture in the rural schools, in the high schools, and in the lower grades.

A special circular giving details of the Summer School may be obtained by application to the President of the College. The article in this catalogue on the Summer School gives brief information.

## Division of Mechanic Arts

ANDREY ABRAHAM POTTER, *Acting Dean.*

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The Division of Mechanic Arts includes courses in agricultural engineering, architecture, civil and highway engineering, electrical engineering, and mechanical engineering, each leading to the degree of bachelor of science in the profession selected.

The work of the freshman year is the same in all courses; the work of the sophomore year is the same for students of mechanical engineering and electrical engineering, and, except that surveying is substituted for shop work, is the same for the course in civil engineering. For the course in architecture the plan of studies for the sophomore year is somewhat further modified.

While the courses offered are believed to be sufficient to cover the needs of the average young man, it is possible to combine portions of the work of two or more of these courses in such a way that one may be prepared to take up a special line of work for which he desires to fit himself. For example, by substituting certain subjects from the departments of chemistry and geology for some of those in the course in mechanical engineering, a young man can fit himself for work in connection with the manufacture of cement. By substituting some of the subjects in chemistry for others in mechanical engineering, a special preparation can be secured for chemical engineering. By combining some of the subjects of the courses in civil and mechanical engineering and by taking additional work in chemistry and geology, a young man may fit himself for special work in connection with the development of the coal fields throughout the country. By combining work in the courses in architecture and civil engineering, specialization in architectural engineering may be secured. In special cases permission will be granted to combine the work on the lines here indicated.

However, it is believed that the courses as tabulated give the best preparation for students expecting to follow general work in the profession selected, and for those who are not absolutely certain what branch of their profession they will follow. The substitutions and combinations indicated, and others similar to them, will be permitted only when there is good evidence that the student desiring such work is practically certain to follow the branch selected.

In the case of any of these modifications, the degree granted will be that of the course in which the major portion of the work is taken. In no case will the substitution of an additional amount of technical work for any of the general cultural work in the course be allowed.

### COURSE IN AGRICULTURAL ENGINEERING

The course in agricultural engineering with its three options is designed to fit men as irrigation engineers, as designers of farm machinery and motors, or as flour-mill engineers and designers.

The work of the first year is the same as in the other engineering courses. During the second, third, and fourth years, students choosing the farm machinery option take considerable shop work, mechanics, kinematics, farm motors, farm machinery, hydraulics, and designing, besides such fundamental agricultural subjects as crops, soils, and farm management. In the irrigation and drainage engineering option the work of the second, third, and fourth years includes fundamental civil engineering subjects, such as surveying, civil engineering drawing, masonry and concrete design, structures. Considerable time is also devoted to problems in irrigation and drainage engineering, supplemented by courses in shop work, hydraulics, mechanics, crops, and soils. In the flour milling option considerable time is devoted to chemistry, flour-mill design, crops, grain inspection, wheat and flour testing, and milling practice. The student, in this option, is given the fundamental subjects in the mechanical-engineering course, including shop work, mechanical drawing, applied mechanics, hydraulics, and steam and gas engineering.

No student taking the course in agricultural engineering will be allowed to graduate who has not had at least six months' practical experience in the work of the option selected.

### COURSE IN ARCHITECTURE

The course in architecture was organized to train men in the general field of architecture and also to relate the principles of architecture to farm buildings and grounds. The rapid increase in wealth in the State creates a demand for designers and builders of every type.

The freshman year of this course is identical with that of the other courses of the division of mechanic arts. The other three years are devoted to the study of pure and applied mathematics, mechanics, physics, history of architecture, municipal improvements, modern steel and cement construction, rural landscape architecture. The course aims to develop the creative powers of the student in the fields of original composition. From ten to sixteen hours a week, for the last three

years of the course, are given to work of this kind over the drawing table.

The College is well equipped for the maintenance of a course in architecture. It owns a collection of several hundred plaster casts, tile and terra cotta samples, marble specimens, etc. It has a fine collection of models of the classic orders; a collection of blue-prints of residences, schoolhouses and churches, and of nearly all the Kansas state buildings; a large number of modern books on architecture and engineering; a complete set of the international edition of the *American Architect*; a complete set of the *Inland Architect*, and sets of several European architectural magazines; a well-equipped blue-print room, etc. The substantial stone buildings of the institution, their complete system of water-supply, drainage, heating and lighting, and one of the largest and handsomest campuses in America, furnish excellent illustrative material.

Students taking the course in architecture are expected to devote their summer vacations to practical work in actual building operations.

#### COURSE IN CIVIL AND HIGHWAY ENGINEERING

The aim of the course in civil engineering, with options in highway engineering, as outlined in the catalogue, is to give to the young men taking the course the best possible preparation for entering upon the active practice of the profession under present conditions. It will be noted that the first and second years of the course are devoted almost entirely to general culture studies and the sciences, including mathematics. This follows the arrangement generally found in the engineering courses of American colleges, and it finds its justification in the well-nigh universally accepted idea that any engineering education worthy of consideration must be grounded upon ample preliminary education in the allied sciences. In recognition of the mechanical trend of the age, liberal provision is made in the course for class and laboratory work in mechanical and electrical engineering.

In view of the growing importance of municipal problems, such as paving, sewerage and water-supply, the course in civil engineering includes a required course in municipal engineering, supplemented by courses in sanitary biology and chemistry.

The work in highway engineering affords time for an unusually thorough course in this subject, which is of such great importance at the present time. It includes courses in road machinery, and road building.

A liberal course in drainage and irrigation engineering is introduced for those who may wish to take up this line of work, which is coming rapidly into prominence.

### COURSE IN ELECTRICAL ENGINEERING

The essential elements underlying a sound engineering training are based upon a thorough study of mathematics and the physical sciences. The professional work of this course begins in the third year and continues throughout the rest of the course. General culture subjects are offered during the first three years of the course.

Emphasis is placed upon training to deal with forces and matter according to scientific principles, rather than upon the accumulation of facts. The department laboratories are well equipped with the various measuring instruments, standardizing apparatus, and the different types of dynamo machinery. The different subjects are presented in the classroom, and the classroom work is supplemented by laboratory practice. The course provides a liberal training in wood- and iron-working, mechanical drawing, and machine-shop practice. The laboratory experiments selected for the student are designed to give a clear conception of the theoretical work of the classroom.

Students are given extensive practice in connecting up the different types of machines for testing purposes and for standard commercial work. This practice work and testing extends throughout the junior and senior years, and is intended to give the student familiarity with the underlying principles of the different machines, and a knowledge of the care necessary to operate them successfully. Opportunity is also given to undertake the investigation of commercial problems as they are sent to the College from the different central stations of the State.

In connection with the regular work of the classroom and the laboratory, extensive references are given to leading books and to current literature on technical engineering. In connection with the laboratory work a certain amount of library work is required. In the year 1908 a College branch of the American Institute of Electrical Engineers was organized. The branch meets the first Tuesday of each month. At these meetings the instructors meet with the students for the discussion of technical subjects in engineering. Consulting engineers and central-station managers are invited to present papers at these meetings.

### COURSE IN MECHANICAL ENGINEERING

The course in mechanical engineering prepares for the successful management and superintendence of factories and power plants; for the design of power and machinery installations; for the design and construction of machine tools, steam and gas engines, compressors, hydraulic machinery, etc.; and for the design and erection of mill and engineering buildings.

The course of study has been laid out with the aim of securing a judicious mixture of theory and practice, such as

will not only give the student the technical skill required for engineering operations, but will also give him a broad grasp of the fundamental principles of his profession.

It is not the intention in this course to give the young man training similar to that received in serving an apprenticeship, but rather to instruct him in the technical and theoretical principles upon which the art of mechanical engineering is based, without a thorough knowledge of which a man can not rise to a position of responsibility in this profession. The advantages of combining a practical application of principles with theoretical instruction, while these principles are being impressed upon the student by classroom work, are well known.

The course in shop work, being purely educational in its character, is designed to teach the various methods of doing shop work, the operations that may be performed upon the different machines, and upon what machines certain operations can be performed most economically, as well as to acquaint the student with what may be expected not only from the machines, but from the men operating them. In order to secure this knowledge it is necessary that the student should perform a large variety of operations. To accomplish this result, an appreciable proportion of the course consists of graded exercises. Wherever possible the student also is assigned to work on apparatus and machinery that is being built for use in the engineering or other departments of the College, a large amount of which is constantly under way in the shops.

Each student in the course in mechanical engineering is required to present before graduation a satisfactory thesis that shows the results of original research along engineering lines.

### Course in Agricultural Engineering

Option 1—Farm Machinery  
Option 2—Irrigation and Drainage Engineering  
Option 3—Flour Milling

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

FRESHMAN		
FALL	WINTER	SPRING
English I 4 (4-0)	English II 4 (4-0)	English Literature 4 (4-0)
	Library Methods E 1 (0-2)	
Chemistry I 4 (3-2)	Chemistry II 4 (2-4)	Chemistry III 4 (3-2)
Plane Trigonometry 4 (4-0)	College Algebra 4 (4-0)	Analytical Geometry 4 (4-0)
Descriptive Geometry I 3 (2-2)	Descriptive Geometry II 3 (2-2)	Descriptive Geometry III 3 (2-2)
Blacksmithing I 3 (1-4)	Blacksmithing II 2 (0-4)	Foundry 3 (1-4)
Military Drill	Military Drill	Military Drill

AGRICULTURAL ENGINEERING—*continued*

## SOPHOMORE

FALL	WINTER	SPRING
Engineering Physics I 5 (4-2)	Engineering Physics II 5 (4-2)	Engineering Physics III 6 (4-4)
Calculus I 4 (4-0)	Calculus II 4 (4-0)	Calculus III 4 (4-0)
Mechanical Drawing I 2 (1-2)	Mechanical Drawing II 3 (1-4)	Machine Shop 2 (0-4)
Military Drill	Extempore Speech 2 (2-0)	Military Drill
<i>Option I</i>	Military Drill	<i>Option I</i>
Pattern Making 3 (1-4)	<i>Options I and II</i>	Surveying 3 (1-4)
Kinematics I 4 (4-0)	Industrial History 4 (4-0)	Mechanical Drawing III 3 (0-6)
<i>Option II</i>		<i>Option II</i>
Surveying I 7 (4-6)		General Bacteriology 4 (2-4)
		Agricultural Chemistry 2 (2-0)
<i>Option III</i>	<i>Option III</i>	<i>Option III</i>
Pattern Making 3 (1-4)	Kinematics I 4 (4-0)	Quantitative Analysis I 3 (0-6)
Qualitative Analysis 4 (2-4)		Mechanical Drawing III 3 (0-6)

## JUNIOR

Applied Mechanics I 5 (4-2)	Applied Mechanics II 5 (4-2)	Hydraulics 4 (3-2)
Cereal Crop Production 5 (3-4)		Economics 4 (4-0)
Machine Shop II 2 (0-4)		
<i>Options I and II</i>	<i>Options I and II</i>	<i>Option I</i>
General Geology 4 (4-0)	Farm Motors I 4 (2-4)	Farm Motors II 3 (2-2)
Elective 2 (-)	Soils I 5 (3-4)	Farm Machinery 4 (2-4)
	<i>Option I</i>	Elective 3 (-)
	Machine Shop III-A 4 (1-6)	
	<i>Option II</i>	<i>Option II</i>
	Graphic Statics 2 (0-4)	Farm Motors II 3 (2-2)
	C. E. Drawing I 2 (0-4)	Farm Machinery 4 (2-4)
		Foundations 3 (3-0)
<i>Option III</i>	<i>Option III</i>	<i>Option III</i>
Quantitative Analysis II 2 (0-4)	Quantitative Analysis III 2 (0-4)	Electrical Engineering C 4 (3-2)
Commercial Grain and Grain Inspection 4 (3-2)	Advanced Industrial History 4 (4-0)	Machine Shop IV 4 (1-6)
	Grain Products 4 (3-2)	Experimental Milling 2 (0-4)
	Machine Shop III 3 (1-4)	



AGRICULTURAL ENGINEERING—*continued*

SENIOR		
FALL	WINTER	SPRING
<i>Options I and II</i>	<i>Options I and II</i>	<i>Options I and II</i>
Hydraulic Machinery 3 (2-2)	Farm Management 4 (3-2)	Electrical Engineering C 4 (3-2)
		Business Organization 2 (2-0)
		Highway Engineering 3 (3-0)
		Concrete Construction 3 (1-4)
		Business Law 2 (2-0)
<i>Option I</i>	<i>Option I</i>	<i>Option I</i>
Farm Machinery II 3 (0-6)	Farm Buildings and Equip. 5 (2-6)	Factory Design 3 (0-6)
Traction Engines 3 (1-4)	Factory Engineering 2 (2-0)	Thesis
Machine Design I 3 (1-4)	Machine Design II-A 2 (1-2)	
Electives 6 ( - )	Electives 5 ( - )	
Thesis	Thesis	
<i>Option II</i>	<i>Option II</i>	<i>Option II</i>
Drainage and Irrigation I 3 (3-0)	Drainage and Irrigation II 3 (1-4)	Drainage and Irrigation III 3 (0-6)
Surveying II 7 (4-6)	Structures 6 (3-6)	Thesis
Electives 4 (4-0)	Masonry and Concrete 5 (3-4)	
Thesis	Thesis	
<i>Option III</i>	<i>Option III</i>	<i>Option III</i>
Flour Mill Design I 5 (2-6)	Flour Mill Design II 3 (0-6)	Heating and Ventilation 3 (2-2)
Steam and Gas Engr. E-I 5 (4-2)	Steam and Gas Engr. E-II 5 (4-2)	Milling Entomology 2 (2-0)
Advanced Exper. Milling 4 (0-8)	Wheat and Flour Testing 4 (1-6)	Experimental Baking Tests 4 (0-8)
General Entomology 4 (3-2)	Factory Engineering 2 (2-0)	Milling Practice 4 (0-8)
	Business Organization 2 (2-0)	Factory Design 3 (0-6)
	Business Law 2 (2-0)	Thesis
Thesis	Thesis	

## Course in Architecture

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

FRESHMAN		
FALL	WINTER	SPRING
English I 4 (4-0)	English II 4 (4-0)	English Literature 4 (4-0)
	Library Methods E 1 (0-2)	
Chemistry I 4 (3-2)	Chemistry II 4 (2-4)	Chemistry III 4 (3-2)
Plane Trigonometry 4 (4-0)	College Algebra 4 (4-0)	Analytical Geometry 4 (4-0)
Descriptive Geometry I 3 (2-2)	Descriptive Geometry II 3 (2-2)	Descriptive Geometry III 3 (2-2)
Blacksmithing I 3 (1-4)	Blacksmithing II 2 (0-4)	Foundry 3 (1-4)
Military Drill	Military Drill	Military Drill

## ARCHITECTURE—continued

## SOPHOMORE

FALL	WINTER	SPRING
Engineering Physics I 5 (4-2)	Engineering Physics II 5 (4-2)	Engineering Physics III 6 (4-4)
Advanced Industrial History 4 (4-0)	General Bacteriology 4 (2-4)	Extempore Speech 2 (2-0)
Residences 4 (4-0)	Historic Ornament 4 (4-0)	Kinematics I 4 (4-0)
Shades and Shadows 2 (0-4)	Linear Perspective 2 (0-4)	Surveying 3 (1-4)
Architectural Drawing I 3 (0-6)	Architectural Drawing II 3 (0-6)	Architectural Drawing III 3 (0-6)
Military Drill	Military Drill	Military Drill

## JUNIOR

History of Architecture I 4 (4-0)	History of Architecture II 4 (4-0)	History of Architecture III 4 (4-0)
Economics 4 (4-0)	Business Law 2 (2-0)	Engineering Geology 6 (4-4)
Acoustics 1 (1-0)	Business Organization 2 (2-0)	Graphic Statics 2 (0-4)
Advanced Woodwork 3 (1-4)	Heating 4 (4-0)	Mural Decoration 3 (0-6)
Clay Modeling 3 (0-6)	Color and Design A 3 (0-6)	
Architectural Composition I 3 (0-6)	Architectural Composition II 3 (0-6)	Architect'l Composition III 3 (0-6)

## SENIOR

Public Buildings 4 (4-0)	Specifications 4 (4-0)	Landscape Architecture 4 (4-0)
Plumbing 2 (2-0)	Trusses 4 (2-4)	Power and Lighting 4 (3-2)
Beams and Arches 3 (1-4)	Architectural Seminar 4 (4-0)	Landscape Design 4 (0-8)
Municipal Improvements 4 (4-0)	Color Rendering 2 (0-4)	
Ink Rendering 2 (0-4)		
Architect'l Composition IV 3 (0-6)	Architectural Composition V	Architectural Thesis 6 (0-12)

## Course in Civil and Highway Engineering

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

## FRESHMAN

FALL	WINTER	SPRING
English I 4 (4-0)	English II 4 (4-0)	English Literature 4 (4-0)
Chemistry I 4 (3-2)	Chemistry II 4 (2-4)	Chemistry III 4 (3-2)
Plane Trigonometry 4 (4-0)	College Algebra 4 (4-0)	Analytical Geometry 4 (4-0)
Descriptive Geometry I 3 (2-2)	Descriptive Geometry II 3 (2-2)	Descriptive Geometry III 3 (2-2)
	Library Methods E 1 (0-2)	
Blacksmithing I 3 (1-4)	Blacksmithing II 2 (0-4)	Foundry 3 (1-4)
Military Drill	Military Drill	Military Drill

CIVIL AND HIGHWAY ENGINEERING—*continued*

SOPHOMORE

FALL	WINTER	SPRING
Calculus I 4 (4-0)	Calculus II 4 (4-0)	Calculus III 4 (4-0)
Engineering Physics I 5 (4-2)	Engineering Physics II 5 (4-2)	Engineering Physics III 6 (4-4)
Mechanical Drawing I 2 (1-2)	General Bacteriology 4 (2-4)	Mechanical Drawing II 3 (1-4)
Surveying I 7 (4-6)	Military Drill	Extempore Speech 2 (2-0)
Military Drill	<i>Option I</i>	Foundations 3 (3-0)
	Chemistry C 5 (1-8)	Military Drill
	<i>Option II</i>	
	Soils 5 (1-8)	

JUNIOR

Economics 4 (4-0)	Business Law 2 (2-0)	Engineering Geology 6 (4-4)
Surveying II 7 (4-6)	Business Organization 2 (2-0)	Hydraulics 4 (3-2)
Applied Mechanics I 5 (4-2)	Applied Mechanics II CE 6 (4-4)	Applied Mechanics III 4 (3-2)
<i>Option I</i>	Advanced Industrial History 4 (4-0)	
Spherical Trigonometry 2 (2-0)	Graphic Statics 2 (0-4)	C. E. Drawing II 4 (0-8)
<i>Option II</i>	C. E. Drawing I 2 (0-4)	
Road Machinery Laboratory 2 (2-0)		

SENIOR

Bridge Stresses 4 (4-0)	Bridge Design 6 (3-6)	Electrical Engineering CE 4 (3-2)
Steam and Gas Engr. C 4 (3-2)	Railways I 3 (3-0)	<i>Option I</i>
Drainage and Irrigation I 3 (3-0)	Masonry and Concrete 5 (3-4)	Railways II 4 (0-8)
<i>Option I</i>	<i>Option I</i>	Geodesy 4 (2-4)
Water Supply and Sewerage 4 (4-0)	Astronomy 3 (2-2)	Highway Engineering 3 (3-0)
Hydraulic Machinery 3 (2-2)		
Thesis	Thesis	Thesis
<i>Option II</i>	<i>Option II</i>	<i>Option II</i>
Highway Engineering I 7 (4-6)	Highway Engineering II 4 (4-0)	Concrete Construction 2 (0-4)
		Specification and Inspection 2 (2-0)
		Highway Engineering III 7 (3-8)
Thesis	Thesis	Thesis

### Course in Electrical Engineering

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

#### FRESHMAN

FALL	WINTER	SPRING
English I 4 (4-0)	English II 4 (4-0)	English Literature 4 (4-0)
Chemistry I 4 (3-2)	Chemistry II 4 (2-4)	Chemistry III 4 (3-2)
Plane Trigonometry 4 (4-0)	College Algebra 4 (4-0)	Analytical Geometry 4 (4-0)
Descriptive Geometry I 3 (2-2)	Descriptive Geometry II 3 (2-2)	Descriptive Geometry III 3 (2-2)
	Library Methods E 1 (0-2)	
Blacksmithing I 3 (1-4)	Blacksmithing II 2 (0-4)	Foundry 3 (1-4)
Military Drill	Military Drill	Military Drill

#### SOPHOMORE

Advanced Industrial History 4 (4-0)	Kinematics 4 (4-0)	Surveying 3 (1-4)
Engineering Physics I 5 (4-2)	Engineering Physics II 5 (4-2)	Engineering Physics III 6 (4-4)
Calculus I 4 (4-0)	Calculus II 4 (4-0)	Calculus III 4 (4-0)
Mechanical Drawing I 2 (1-2)	Mechanical Drawing II 3 (1-4)	Mechanical Drawing III 3 (0-6)
Pattern Making 3 (1-4)	Machine Shop I 2 (0-4)	Machine Shop II 2 (0-4)
Military Drill	Military Drill	Military Drill

#### JUNIOR

Economics 4 (4-0)	Extempore Speech 2 (2-0)	Business Law 2 (2-0)
Seminar E I 1 (1-0)		Business Organization 2 (2-0)
Applied Mechanics I 5 (4-2)	Applied Mechanics II CE 6 (4-4)	Hydraulics 4 (3-2)
Theory of Electricity I 5 (4-2)	Theory of Electricity II 4 (3-2)	Electrical Instruments and Calibration 4 (2-4)
Machine Shop III 3 (1-4)	D. C. Machines I 6 (4-4)	D. C. Machines II 6 (4-4)

#### SENIOR

D. C. Machine Design 4 (2-4)	Seminar E II 2 (2-0)	Generation and Distribution of Elec. Energy 4 (4-0)
Steam and Gas Engr. E I 5 (4-2)	Steam and Gas Engr. E II 5 (4-2)	Refrigeration 3 (2-2)
A. C. Machines I 6 (4-4)	A. C. Machines II 6 (4-4)	A. C. Machine Design 2 (1-2)
		Power-plant Design and Specifications 4 (1-6)
Hydraulic Machinery 3 (2-2)	Telephone Engineering 4 (3-2)	Illuminating Engineering 3 (2-2)
Thesis	Thesis	Thesis

# **Course in Mechanical Engineering**

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

## **FRESHMAN**

FALL	WINTER	SPRING
English I 4 (4-0)	English II 4 (4-0)	English Literature 4 (4-0)
	Library Methods E 1 (0-2)	
Chemistry I 4 (3-2)	Chemistry II 4 (2-4)	Chemistry III 4 (3-2)
Plane Trigonometry 4 (4-0)	College Algebra 4 (4-0)	Analytical Geometry 4 (4-0)
Descriptive Geometry I 3 (2-2)	Descriptive Geometry II 3 (2-2)	Descriptive Geometry III 3 (2-2)
Blacksmithing I 3 (1-4)	Blacksmithing II 2 (0-4)	Foundry 3 (1-4)
Military Drill	Military Drill	Military Drill

## **SOPHOMORE**

Advanced Industrial History 4 (4-0)	Kinematics 4 (4-0)	Surveying 3 (1-4)
Engineering Physics I 5 (4-2)	Engineering Physics II 5 (4-2)	Engineering Physics III 6 (4-4)
Calculus I 4 (4-0)	Calculus II 4 (4-0)	Calculus III 4 (4-0)
Mechanical Drawing I 2 (1-2)	Mechanical Drawing II 3 (1-4)	Mechanical Drawing III 3 (0-6)
Pattern Making 3 (1-4)	Extempore Speech 2 (2-0)	Machine Shop I 2 (0-4)
Military Drill	Military Drill	Military Drill

## **JUNIOR**

Economics 4 (4-0)	Business Law 2 (2-0)	Hydraulics 4 (3-2)
	Business Organization 2 (2-0)	Graphic Statics 2 (0-4)
Applied Mechanics I 5 (4-2)	Applied Mechanics II M 5 (4-2)	Applied Mechanics III 4 (3-2)
Steam and Gas Engineer'g I 4 (4-0)	Steam and Gas Engr. II 4 (3-2)	Steam and Gas Engr. III 4 (3-2)
Kinematics II 3 (2-2)	Mechanical Drawing IV 2 (0-4)	
Machine Shop II 2 (0-4)	Machine Shop III 3 (1-4)	Machine Shop IV 4 (1-6)

## **SENIOR**

Applied Mechanics IV 3 (2-2)	Factory Engineering 2 (2-0)	Factory Design 3 (0-6)
	Power Plant Engineering 2 (2-0)	Power Plant Design 2 (0-4)
Steam and Gas Engr. IV 4 (3-2)	Steam and Gas Engr. V 4 (3-2)	Refrigeration 3 (2-2)
Electrical Engineering M I 5 (4-2)	Electrical Engineering M II 5 (4-2)	Heating and Ventilation 3 (2-2)
Machine Design I 3 (1-4)	Machine Design II 2 (0-4)	Machine Design III 3 (0-6)
Hydraulic Machinery 3 (2-2)	Machine Shop V 2 (0-4)	Machine Shop VI 2 (0-4)
Thesis	Thesis	Thesis

## Applied Mechanics and Machine Design

Professor SEATON  
 Instructor BOWERMAN  
 Instructor FREEMAN  
 Assistant \_\_\_\_\_  
 Assistant \_\_\_\_\_

The courses in applied mechanics are designed primarily to teach the graphical and analytical methods of determination, both of the forces acting on the parts of structures and machines, and of the effect of these forces on the parts, together with the fundamental principles of the design of the parts to meet specified conditions. The course is intended to be of a highly practical character. For the purpose of better fixing in the mind of the student the principles taught, the solution of a large number of problems involving these principles is required in both the applied mechanics and hydraulics. The principles are further illustrated by means of the laboratory and drafting-room work, which parallels the classroom instruction. The textbooks in several of the courses are supplemented by notes and assigned reference work.

### APPLIED MECHANICS LABORATORY

For testing the strength of materials this laboratory is provided with a 100,000-pound Riehle Universal Testing Machine, a 200,000-pound Olsen Universal Testing Machine adapted for receiving columns up to 15 feet in length, a 250,000-inch-pound Torsion Testing Machine, a 10,000-pound beam testing machine and the auxiliary apparatus usually found in such laboratories.

This laboratory also contains transmission and absorption dynamometers, an oil and bearing testing machine, screws, jacks, hoists, scales, gauges and other small instruments for taking weights and measurements. There is a full equipment of apparatus for making standard cement and concrete tests, a concrete building block machine and molds for various concrete products, such as drainage tile and fence posts.

The road materials laboratory contains an Olsen standard rattler for testing paving brick, a ball mill briquette former, impact machines, abrasion machine, hardness testing machine, diamond saw, core drill, and the usual auxiliary apparatus, as scales, ovens, etc.

### HYDRAULICS LABORATORY

The hydraulics laboratory contains two hydraulic pits of 25,000 gallons capacity each, an air-pressure tank, two hydraulic rams, two 4-inch volute centrifugal pumps, one 18-inch deep-well four-stage centrifugal pump, one positive rotary pump, two deep-well reciprocating pumps, a water motor, a Pelton-Doble water wheel, a small Price current meter, a Haskell current meter, and many pieces of small apparatus, such as weirs, scales, tanks, hook gauges, pressure gauges, and manometers.

All laboratory tests of a commercial character are conducted in accordance with the standard methods prescribed by the national societies. Complete reports are required of the students on all laboratory exercises.

## COURSES IN APPLIED MECHANICS AND MACHINE DESIGN

1.—APPLIED MECHANICS I. Junior year, fall term. Class work, four hours; laboratory, two hours. Five credits. Prerequisites: Calculus III; Engineering Physics III.

This course includes composition, resolution and conditions of equilibrium of concurrent and nonconcurrent forces; center of gravity; laws of rectilinear and curvilinear motion of material points; moments of inertia; relations between forces acting on rigid bodies and the resulting motions; work energy and power; graphical solutions of problems in statics. Text, Hancock's *Applied Mechanics for Engineers*.

2.—APPLIED MECHANICS II. Junior year, winter term. Class work, four hours; laboratory, two or four hours. Five or six credits. Prerequisite: Applied Mechanics I.

This course treats of the following: behavior of materials subjected to tension, compression, and shear; riveted joints; torsion; shafts, and the transmission of power; strength and stiffness of beams and cantilevers; bending moments and shear forces in beams; design of beams of wood, cast iron, steel, and reinforced concrete; design of built-up beams and box girders; resilience of beams; stresses in columns and hooks; and the design of columns of wood, cast iron, steel, and concrete. Text, Boyd's *Strength of Materials*. *Cambria Steel* is used for reference.

3.—GRAPHIC STATICS. Junior year, winter and spring terms. Drafting-room practice, supplemented by lectures, four hours. Two credits. Prerequisite: Applied Mechanics II; or the two courses may be taken together.

The graphical solution of stresses existing in a number of typical trusses, with a detail design of one of the simpler forms of roof trusses is the subject matter of the course.

4.—APPLIED MECHANICS III. Junior year, spring term. Class work, three hours; laboratory, two hours. Four credits. Prerequisite: Applied Mechanics II.

This course treats of stresses in continuous and built-up beams; masonry arches, and arch ribs; stability of dams and retaining walls; properties of materials for reinforced concrete; mechanical bond; rectangular and T beams; double reinforced beams; web reinforcing; columns reinforced with bars and hoops; reinforced concrete in building construction; design of slabs, beams, girders, and columns. Texts, *Boyd's Strength of Materials*, and Turneaure and Maurer's *Principles of Reinforced Concrete Construction*.

5.—HYDRAULICS. Junior year, spring term. Class work, three hours; laboratory, two hours. Four credits. Prerequisite: Applied Mechanics I.

This course includes a study of fluid pressure, stresses in containing vessels and pipes, center of pressure, immersion and flotation; of Bernoulli's theorem, with applications; of flow through orifices, weirs, short and long pipes; of loss of head due to various causes; of flow of water in open channels, and its measurement; of Kutter's formula; of impulse and reaction of a jet; of power of jets; of plates moving in fluids. Text, Russel's *Textbook on Hydraulics*.

6.—APPLIED MECHANICS IV. Senior year, fall term. Class work, three hours. Three credits. Prerequisite: Applied Mechanics III.

Dynamics of machinery, friction, lubrication and lubricants, are studied in this course. Text, Lanza's *Dynamics of Machines*.

7.—HYDRAULIC MACHINERY. Senior year, fall term. Class work, two hours; laboratory, two hours. Three credits. Prerequisite: Hydraulics.

This course treats of elements of water power; design, construction

and operation of gravity motors, impulse wheels and turbines; regulation of water motors; testing of impulse wheels and turbines; centrifugal, turbine and reciprocating pumps; pressure engines, accumulators, and hydraulic rams. Text, Church's *Hydraulic Motors*.

### COURSES IN APPLIED MECHANICS LABORATORY

Text: Carpenter and Diederich's *Experimental Engineering*.

1.—APPLIED MECHANICS I LABORATORY. Junior year, fall term. Two hours a week. One credit. Applied Mechanics I must accompany or precede this course.

This course consists of the calibration and use of laboratory measuring instruments and apparatus, and tests of cements and concrete aggregates.

2.—APPLIED MECHANICS II-CE (AND II-M). Junior year, winter term. Four hours, two credits; and two hours, one credit, respectively.

This course covers tensile, compressive, and transverse tests of wood, metals, and concrete, mixing and handling concrete, and for civil engineering students are tests of road-making and paving materials.

3.—APPLIED MECHANICS III LABORATORY. Junior year, spring term. Five hours per week. One credit. Prerequisite: Applied Mechanics II Laboratory.

This is a continuation of the work of the preceding term, with tests of full-size columns and beams, use of the strain gauge in determining the elastic stresses in structures, torsion tests of metals, tests of building brick and stone, and the manufacture of cast concrete specimens.

4.—HYDRAULIC LABORATORY. Junior year, spring term. Two hours a week. One credit.

This course includes tests to determine the coefficients of weirs, orifices, tubes, and pipes; use and calibration of water meters; tests to determine loss of head in pipes due to various causes, and the measurement of water in open streams. Prerequisite: Applied Mechanics I Laboratory. Hydraulics must accompany or precede this course.

5.—APPLIED MECHANICS IV LABORATORY. Senior year, fall term. Two hours a week. One credit. Taken in connection with Applied Mechanics IV.

This course includes tests of bearings and lubricants; impact tests, measurements of power in transmission, and of slippage of belts. About half the time of the course is spent in the drafting-room in the determination of the cyclic energy distribution at the crank shaft of a steam engine, and the design of flywheels for a stated degree of speed regulation. Prerequisite: Applied Mechanics III. Applied Mechanics IV must accompany or precede this course.

6.—HYDRAULIC MACHINERY LABORATORY. Senior year, fall term. Two hours a week. One credit. Taken in connection with Hydraulic Machinery. Prerequisite: Hydraulic Laboratory. Hydraulic Machinery must accompany or precede this course.

The course includes tests on water wheels, water motors, rams, and pumps.



COURSES IN MECHANICAL DRAWING AND  
MACHINE DESIGN

1.—MECHANICAL DRAWING I. Sophomore year, fall term. Lectures and recitations, one hour; drafting-room practice, two hours. Two credits. Prerequisite: Descriptive Geometry II.

The course includes the use and care of drawing instruments, with simple exercises in making working drawings from given plates. Special attention is given to the arrangement of views to secure balance, and to the subject matter and layout of titles and notes. The following supplies are required: triangles, T-square, scale, pencils, pens, ink, erasers, thumb tacks, drawing paper, and a set of drawing instruments. Students are advised not to purchase these supplies until after consulting with the instructor. Text, French's *Engineering Drawing*.

2.—MECHANICAL DRAWING II. Sophomore year, winter term. Lectures and recitation, one hour; drafting-room practice, four hours. Three credits. Prerequisites: Mechanical Drawing I; Descriptive Geometry III.

Free-hand sketches are made from simple machine parts, followed by complete working drawings from these sketches without further reference to the objects. Special emphasis is laid upon the proper selection of views to present the necessary information in convenient form, and to give the proper dimensioning of the drawings. Text, French's *Engineering Drawing*.

3.—KINEMATICS I. Sophomore year, spring term. Lectures and recitations, four hours. Four credits. Prerequisites: Plane Trigonometry; Descriptive Geometry II.

An analysis of the motions and forms of the parts of machines constitutes this course. Among the subjects discussed are: bearings, screws, worm and wheel, rolling cylinders, cones, and other surfaces; belts, cords and chains, levers, cams and linkwork, with the velocity and motion diagrams; quick returns, straight-line motions, and other special forms of linkages; conjugate curves for gear teeth, cycloidal and involute systems of gearing, spur, annular and bevel gears, and special forms of gearing. The solution of a large number of graphical and mathematical problems is required in this course. Text, Schwamb and Merrill's *Elements of Mechanism*.

4.—MECHANICAL DRAWING III. Sophomore year, spring term. Drafting-room practice, six hours. Three credits. Prerequisite: Mechanical Drawing II. Kinematics I must accompany or precede this course.

The work in the first part of the term is a continuation of that given in Mechanical Drawing II. This is followed by the design of cams, gears, and quick returns to fulfill specified conditions. Center-line drawings are first made, embodying the solution of the problems, and upon these are built working drawings of machine parts. An effort is made to follow standard practice in the design of those details usually determined by empirical methods. Velocity diagrams are drawn for the cams and quick returns. Gear teeth are accurately rolled and drawn from templates prepared by the student.

5.—KINEMATICS II. Junior year, fall term. Lectures and recitations, two hours; drafting-room practice, two hours. Three credits. Prerequisites: Kinematics I; Mechanical Drawing III.

This course is a continuation of Kinematics I, consisting of a consideration of the following subjects: mechanisms for producing intermittent motion, such as clicks, ratchets, and escapements; wheels in trains; and combinations of mechanisms. The drafting-room practice is a continuation of the work given in Mechanical Drawing III, and consists of the application of the classroom instruction to some simple problems in the design of mechanisms. Text, Schwamb and Merrill's *Elements of Mechanism*.

6.—MECHANICAL DRAWING IV. Junior year, winter term. Drafting-room practice, four hours. Two credits. Prerequisite: Steam Engineering I. Applied Mechanics II must accompany or precede this course.

This includes the solution of a problem on the slide valve by the Zeuner diagram, followed by the design, mostly by empirical methods, of the cylinder, piston, steam chest, and valve of a steam engine. Kent's *Mechanical Engineer's Pocketbook* is extensively used for reference, and each student is expected to have a copy.

7.—MACHINE DESIGN I. Senior year, fall term. Lecture and recitation, one hour; drafting-room practice, four hours. Three credits. Prerequisites: Mechanical Drawing III; Applied Mechanics II; and Steam Engineering II or Farm Motors II.

This course includes a careful study of the fundamentals of machine design. The energy and force problems and the straining action in machine elements are considered, together with the design of these elements to meet specified conditions as to strength and rigidity.

The drafting-room practice consists of the solution of several problems in design based on the principles already learned in Applied Mechanics. In the latter part of the term work is begun on the design of a steam boiler. Calculations are made to determine the dimensions of all parts, and working drawings are made. Text, Kimball and Barr's *Elements of Machine Design*.

8.—MACHINE DESIGN II AND II-A. Senior year, winter term. Drafting-room practice, four hours. Two credits. Prerequisite: Machine Design I.

This is a continuation of the work of the fall term. The design of the steam boiler is completed, and work is begun on the design of a power shear by the mechanical-engineering students, while the agricultural engineering students devote the remainder of the term to the design of farm machinery.

9.—MACHINE DESIGN III. Senior year, spring term. Drafting-room practice, six hours. Three credits. Prerequisite: Machine Design II.

This is a continuation of the work of the winter term, covering the completion of the design of the power shear.

10.—FLOUR MILL DESIGN I. Senior year, fall term. Lectures, two hours; drafting-room practice, six hours. Five credits. Prerequisites: Mechanical Drawing III, and Applied Mechanics II. Advanced Experimental Milling I must accompany or precede this course.

Lectures are given on the fundamental principles of the design and selection of machinery for flour mills. Drafting-room practice is had in the design of machines and in planning the arrangement of machines in flour mills.

11.—FLOUR MILL DESIGN II. Senior year, winter term. Drafting-room practice, six hours. Three credits.

This is a continuation of the work of the preceding term and includes the layout of flow sheets, and the diagramming of mills.

## Architecture and Drawing

Professor WALTERS  
Instructor HARRIS  
Instructor COITH-NELSON  
Assistant HOLMAN  
Assistant AVERILL  
Assistant SMITH

The educational and practical value of a systematic course in the various branches of drawing can hardly be overestimated. The general aims of the several courses in industrial art are the same: (a) the cultivation of observation and analysis of form; (b) the development of correct taste; (c) the teaching of the different methods of graphic representation; (d) the acquirement of skill in handling drawing tools.

The instruction offered in architecture is intended to supply the preliminary training required for the practice of architecture. It recognizes the fact that this instruction must have a three-fold object: first, the teaching of sound modern building construction; second, the teaching of different methods of graphic representation; and third, the development of correct taste.

The first is attained, in connection with the work in other departments, by lectures, and by extended laboratory work in heating, plumbing, concrete construction, steel construction, and electric lighting, also by the preparation of building specifications and by investigations of the legal and ethical relations of architect, owner, and contractor. The second end involves the teaching of correct perception and analysis of form. An average of twelve hours a week throughout the four years is given to projection drawing, descriptive geometry, isometric drawing, linear perspective, shades and shadows, sketching from casts and from life, architectural drawing, and architectural composition. The development of correct taste is sought by offering much work in sketching and rendering, mural decoration, landscape architecture, architectural criticism, and architectural composition. Five terms are devoted to the study of the fundamental principles of design and the styles of the past. Considerable emphasis is also laid on the problems of architecture as related to the needs of rural communities.

### COURSES IN ARCHITECTURE AND DRAWING

1.—FREE-HAND DRAWING. Freshman year, winter or spring term. Drafting-room practice, four hours. Two credits.

Exercises are given in drawing simple figures and ornaments illustrating the effects of geometric arrangement, radiation, repetition, symmetry, proportion, harmony, and contrast; in drawing conventional plant ornaments; in free-hand lettering.

2.—OBJECT DRAWING. Freshman year, fall or spring term. Drafting-room practice, four hours. Two credits.

The course comprises drawing from models and simple objects, and exercises in shading from the object and from imagination.

3.—GEOMETRICAL DRAWING. Freshman or sophomore year, winter term. Drafting-room practice, four hours. Two credits.

In this course are taught construction of perpendiculars, parallels,

angles, polygons, tangent connections, etc.; construction of the ovoid, the oval, the ellipse, and the spiral; the use of the T-square, triangles, the drawing-board, and India ink; lettering.

4.—DESCRIPTIVE GEOMETRY I. Freshman year, fall term. Lectures, two hours; drafting-room practice, two hours. Three credits.

The course includes projection of solids; rotation in space; sections of solids and simple objects; development of surfaces; construction of the conic-section lines; isometric projection; exercises in lettering, inking, and shading.

5.—DESCRIPTIVE GEOMETRY II. Freshman year, winter term. Lectures, two hours; drafting-room practice, two hours. Three credits. Prerequisite: Descriptive Geometry I.

The course includes projection, rotation, and measurement of the straight line and the angle in space; change of ground line; oblique projection; the plane and its traces; various problems pertaining to the straight line and the plane.

6.—DESCRIPTIVE GEOMETRY III. Freshman year, spring term. Lectures, two hours; drafting-room practice, two hours. Three credits. Prerequisite: Descriptive Geometry II.

The single and double curved surfaces of revolution; their tangents and tangent planes; development of surfaces of revolution; sections and interpenetrations of the cylinder, the cone, and the sphere; construction and sections of the hyperboloid of revolution and the paraboloid form the matter of the course.

7.—COLOR AND DESIGN I. Freshman year, spring term. Drafting-room practice, four hours. Two credits.

The course includes discussion of the nature and influence of color, its use and abuse, and the principles that underlie good design and consistent, harmonious color combinations. Original designs in construction and decoration as applied to fabrics, dress, and articles of common use in the home are treated, that young women may recognize and appreciate that which is beautiful and appropriate, and may become more discriminating as purchasers.

8.—SHADES AND SHADOWS. Sophomore year, fall term. Drafting-room practice, four hours. Two credits. Prerequisite: Descriptive Geometry II.

Shadows upon the planes of projection; shadows upon oblique planes and curved surfaces; shades; exercises in brush shading, constitute the subject matter of the course.

9.—RESIDENCES. Sophomore year, fall term. Class work, four hours. Four credits.

The course comprises lectures on location, arrangement, construction, decoration, and sanitation of residences; study of modern residence styles; drawing to scale of plans, elevations, sections, and details of characteristic residences, involving construction in lumber, brick, stone, and concrete.

10 to 12.—ARCHITECTURAL DRAWING I, II, AND III. Sophomore year, fall, winter, and spring terms. Drafting-room practice, six hours; three credits.

The first term is given to the study of Gothic and Romanesque ornaments, tracery windows, and other details, from plaster models and blue-prints. The second term takes up the analysis and study of standard forms of the five orders. The third is devoted to the study of the modern residence and the school building.

13.—HISTORIC ORNAMENT. Sophomore year, winter term. Class work, four hours. Four credits.

This is a course of illustrated lectures on the standard forms of Greek, Roman, and Gothic moldings; the Etruscan, Doric, Ionic, Corinthian and composite columns and their entablatures; the lotus, anthemion, acanthus, and laurel ornament; Roman, medieval, and modern lettering; the ornament of the Gothic period.

14.—LINEAR PERSPECTIVE. Sophomore year, winter term. Drafting-room practice, four hours. Two credits. Prerequisite: Geometrical Drawing.

Vanishing points, vanishing traces, measuring points, cylindric perspective and perspective corrections, are emphasized, and various exercises in representing geometric solids are given.

15.—WORKING DRAWINGS. Sophomore year, spring term. Drafting-room practice, four hours. Two credits.

This course comprises designing and drawing residence plans to scale; detail drawing of furniture and various modern conveniences.

16.—CLAY MODELING. Junior year, fall term. Laboratory, six hours. Three credits.

This course includes clay and plaster modeling of architectural details, historic ornaments, and decorative statuary; also methods of making plaster casts.

17.—COLOR AND DESIGN A. Junior year, winter term. Laboratory, six hours. Three credits.

The influence and nature of color, and the principles that underlie good design and harmonious color combinations. The use and abuse of color in building operations.

18.—HISTORY OF ARCHITECTURE I. Junior year, fall term. Class work, four hours. Four credits.

This study is taught by lectures, illustrated by photographs, plaster models, and stereopticon views. It deals with the development of the architecture of the ancient Egyptians, Chaldeans, Greeks, and Romans.

19.—HISTORY OF ARCHITECTURE II. Junior year, winter term. Class work, four hours. Four credits.

This course comprises a study of the architecture of the medieval and Renaissance periods—Byzantine, Romanesque, Moorish, Gothic, and Renaissance.

20.—HISTORY OF ARCHITECTURE III. Junior year, spring term. Class work, four hours. Four credits.

A study is made of the neo-Greek and the neo-Roman architecture; the revival of the Gothic and the Romanesque; the Colonial, the Mission, and modern American architecture.

21 to 25.—ARCHITECTURAL COMPOSITION I, II, III, IV, V. Beginning with the fall term of the junior year and extending through five consecutive terms. Drafting-room practice, six hours a week. Three credits each term.

The first term is given to the planning of a residence, and involves the preparation of a complete set of plans and elevations, sections and detail drawings. The second term takes up the planning of a Gothic church. The third is given to the planning of a Romanesque school building. The fourth takes up the planning of a small public building in the modern Renaissance. The fifth is given to work in modern steel and concrete architecture of a monumental style. Sets of blue-prints of all finished work must be left with the department, if required by the professor in charge of the work.

26.—HEATING. Junior year, winter term. Class work, four hours. Four credits.

The subject is taught by lectures dealing with the phenomena and laws of heat generation and propagation, systems of heating by means of air, water, and steam, modern methods of ventilation.

27.—MURAL DECORATION. Junior year, spring term. Drafting-room practice, six hours. Three credits. Prerequisite: Color and Design A.

Each student is required to make a series of large water-color studies of interior wall-decoration schemes, including original designs for borders and centerpieces.

28.—PUBLIC BUILDINGS. Senior year, fall term. Class work, four hours. Four credits. Prerequisites: Residences; Historic Ornament.

The course embraces lectures on location, floor arrangement, building materials, style, interior finish, decoration, etc., of schoolhouses, churches, libraries, courthouses, exposition buildings, and other public buildings.

29.—PLUMBING. Senior year, fall term. Class work, two hours. Two credits. Prerequisite: Sanitary Biology I and II.

This course comprises lectures on water supply, plumbing and sewerage of residences; study of city plumbing ordinances and of disposition of sewage.

30.—MUNICIPAL IMPROVEMENTS. Senior year, fall term. Class work, four hours. Four credits.

This is a course of lectures on sidewalk construction, guttering and paving, sanitary sewers and sewage disposition, water supply, etc.

31.—BEAMS AND ARCHES. Senior year, fall term. Class work, three hours. Three credits. Prerequisite: Graphic Statics.

This is a course of lectures on the statics of steel and wood beams, posts, and struts, stone lintels, arches and concrete, reinforced concrete construction. Text, Kidder's *Handbook for Architects*.

32.—INK RENDERING. Senior year, fall term. Drafting-room practice, four hours. Two credits. Prerequisite: Linear Perspective.

The course includes perspectives of buildings and ornamental details; rendering in ink; studio methods.

33.—TRUSSES. Senior year, winter term. Class work, two hours; laboratory, four hours. Four credits. Prerequisite: Beams and Arches.

The course deals with methods of construction and graphic analysis of standard wood and steel trusses. Text, Kidder's *Handbook for Architects*.

34.—SPECIFICATIONS. Senior year, winter term. Class work, four hours. Four credits.

The course comprises discussion and preparation of standard specifications for some of the residences and public buildings planned by the student in the classes in composition; estimates of the materials and labor required in erecting and completing these buildings; methods of making lump estimates; discussion of the principles and form of building contracts; study of the legal relations of the architect, the owner, and the contractor; discussion of state laws concerning the erection of public buildings; labor laws; lien laws; city ordinances; building permits; building insurance; contracts and bonds.

35.—ARCHITECTURAL SEMINAR. Senior year, winter term. Class work, four hours. Four credits.

The course includes a critical study of public buildings, such as the Manhattan library, the Riley County courthouse, the buildings of the College, etc., as well as study and discussion of the work of American

architects, such as Smithmeyer, Upjohn, and Richardson. A critical study is made of the competitive designs for the Cathedral of St. John the Divine, New York, the building of the University of California, etc.

36.—**COLOR RENDERING.** Senior year, winter term. Drafting-room practice, four hours. Two credits.

This is a course in rendering of buildings with their landscape environments, by means of ink or sepia washes, or in water color.

37.—**HOME ARCHITECTURE.** Senior year, winter term. Drafting-room practice, four hours. Two credits. Required in the course in home economics.

This is a study, and drawing in ink, of floor plans, details, and front elevations of modern residences.

38.—**HOME DECORATION.** Senior year, spring term. Drafting-room practice, four hours. Two credits. Required in the course in home economics.

This is a study of design in its application to the home, its plan, furniture, and decorations. Emphasis is laid upon the refining and educating influence of well-chosen and appropriate decoration, the importance of simplicity being urged. Lectures are given on the fine arts and the handicrafts, teaching that the home should show that fine art and industrial art are not to be considered separately. Problems in planning and decorating houses are discussed.

39.—**LANDSCAPE ARCHITECTURE.** Senior year, spring term. Class work, four hours. Four credits.

The principles of landscape design, location and construction of roads and walks, the disposition of trees, shrubs, lawns, and water as landscape features are discussed and studied.

40.—**LANDSCAPE DESIGN.** Senior year, spring term. Drafting-room practice, eight hours. Four credits.

Each student is required to draw and finish in water color a set of plates representing his original designs for a home lot, a public square, a campus, and a small park.

41.—**ARCHITECTURAL THESIS.** Senior year, spring term. Drafting-room practice, fourteen hours. Seven credits.

In the winter and spring of the senior year the student prepares a thesis, consisting of a set of original drawings, complete with details and specifications, for a public building. This work must be done in the drafting room of the department and under the supervision of the professor of architecture, who decides on the cost limit and style of the building and the size and number of plates required.

42.—**FARM ARCHITECTURE.** Elective, spring term. Drafting-room practice, eight hours. Four credits.

The course comprises the preparation of drawings and specifications for barns, dairy stables, and other farm buildings.

## Civil and Highway Engineering

Professor CONRAD  
Professor GEABHART  
Associate Professor WALKER  
Instructor FRAZIER

The instruction in civil and highway engineering is given by means of lectures and recitations, and by the practice in the field, in the drafting room, and in the laboratory. The technical work begins in the fall term of the sophomore year, in which the work in surveying is started. The heaviest technical work of the course falls in the junior and senior years, during which, in addition to studies in other departments, courses are given in civil engineering drawing and in the analysis of stresses and framed structures, structural design, drainage and irrigation engineering, construction and design in masonry and concrete, railways, highway engineering, astronomy, and geodesy. During the entire senior year considerable time is devoted to thesis work.

In addition to the laboratory equipment found in the mechanical and electrical engineering laboratories, which is available to civil engineering students as well, the Department of Civil and Highway Engineering possesses a good assortment of transits, levels, plane tables, tapes, and chains.

### COURSES IN CIVIL ENGINEERING

1.—SURVEYING. Sophomore year, fall and spring terms. Class work, one hour; field work, four hours. Three credits. Prerequisite: Trigonometry.

This is a brief course in the care and use of engineer's surveying instruments. The greater part of the time is devoted to exercises and practical problems involving the use of the transit and level. Text, Pence and Ketchum's *Surveying Manual*.

2.—SURVEYING I. Fall term. Class work, four hours; field and drafting-room work, six hours. Seven credits. Prerequisite: Trigonometry.

The textbook work in this course deals with the use and care of instruments, land topographic and hydrographic surveying. The field and drafting work is devoted to exercises in the use of engineer's surveying instruments and plotting plane surveys. Text, J. B. Johnson's *Theory and Practice of Surveying*.

3.—FOUNDATIONS. Spring term. Class work, three hours. Three credits.

This course is devoted to a study of the principles underlying the design and construction of foundations of all characters in common use at the present time. Text, Fowler's *Ordinary Foundations*.

4.—SURVEYING II. Fall term. Class work, four hours; field and drafting-room work, six hours. Seven credits. Prerequisites: Surveying I.

Recitation work in this course deals with city and mine surveying, computations of volumes, and railroad curves. The field and drafting work is devoted principally to topographical surveying and plotting. Text, J. B. Johnson's *Theory and Practice of Surveying*.

5.—CIVIL ENGINEERING DRAWING I. Winter term. Drafting-room work, four hours. Two credits. Prerequisites: Mechanical Drawing I and II.



This course is devoted to the application of the elementary principles of stereotomy, shades and shadows, isometric drawing, and perspective. These principles are explained to the student by such short lectures as seem necessary for the purpose. No textbook is used.

6.—CIVIL ENGINEERING DRAWING II. Spring term. Drafting-room work, eight hours. Four credits. Prerequisite: Civil Engineering Drawing I.

This is, during the first part of the term, a continuation of the course in graphic statics. About three-fourths of the term is devoted to the design of roof trusses of timber and steel. Text to be selected.

7.—BRIDGE STRESSES. Fall term. Class work, four hours. Four credits. Prerequisites: Applied Mechanics I and II.

This course involves the study of the algebraic method of computing the stresses in bridges and buildings, leading up to the subject of structural design the following term. Text, Merriman and Jacoby's *Roofs and Bridges*, Part I.

8.—WATER SUPPLY AND SEWERAGE. Fall term. Class work, four hours. Four credits. Prerequisite: Hydraulics.

This course deals briefly with the problems of designing and constructing sewer systems and disposal plants for cities of moderate size. Water supply for cities is studied from the standpoints of consumption, collection, storage, distribution, and purification. Texts, Turneaure & Russell's *Public Water Supplies* and Folwell's *Sewerage*.

9.—BRIDGE DESIGN. Winter term. Class work, three hours; drafting-room exercises, six hours. Six credits. Prerequisites: Bridge Stresses, and Civil Engineering Drawing II.

This is a study of the design of timber and of metal structures. In the drafting-room the time is chiefly devoted to working out the details of a plate girder and of a railroad or highway bridge. Text, Merriman and Jacoby's *Roofs and Bridges*, Part III.

10.—RAILWAYS I. Winter term. Class work, three hours. Three credits. Prerequisites: Surveying I and II.

This is a short course in the theory of railroad engineering based on Wellington's economic theory. Considerable time is also devoted to the study of track construction and maintenance, and of the design of the yards and terminals. Text, Raymond's *Elements of Railroad Engineering*, and Nagel's *Field Manual for Railroad Engineers*.

11.—MASONRY AND CONCRETE. Winter term. Class work, three hours; drafting-room work, four hours. Five credits. Prerequisites: Applied Mechanics I, II, and III.

The classroom work takes up the study of the design and construction of structures of masonry and concrete, both plain and reinforced. The time spent in the drafting room is devoted to the design of concrete and masonry retaining walls, dams, arches, slab and girder bridges. Text, Taylor and Thompson's *Concrete*.

12.—STRUCTURES. Winter term. Three recitations per week and six hours in the drawing room. Six credits. Prerequisites: Applied Mechanics II, and Drainage and Irrigation I.

This course is devoted to a study of the design and construction of the various structures of timber, steel, masonry and concrete with which the irrigation engineer has to deal. Text to be selected.

13.—ASTRONOMY. Winter term. Class work, two hours; laboratory, two hours. Three credits. Prerequisites: Trigonometry, Surveying II.

This course is given as a preparation for geodesy the following term. The course, as given, is a practical one, designed to familiarize the stu-

dent with methods of determining latitude, longitude, and azimuth with the ordinary engineer's surveying instruments. Text, Hosmer's *Practical Astronomy*.

14.—RAILWAYS II. Spring term. Drafting-room or field exercises, eight hours. Four credits. Prerequisite: Railway Engineering I.

This is a continuation of the preceding course. The time is devoted principally to the field and office work of railway engineering. In the field a reconnaissance and survey of a short line is made, and the office work consists in working up the maps, profiles, and estimates from the survey. Texts, Raymond's *Elements of Railroad Engineering*, and Nagle's *Field Manual for Railroad Engineers*.

15.—GEODESY. Spring term. Class work, two hours; field work, four hours. Four credits. Prerequisites: Surveying I and II; Astronomy.

Here the precise methods of surveying and leveling are studied. In the field the time is devoted to practice with the plane table, base-line measurement, triangulation, and precise leveling. Text, J. B. Johnson's *Theory and Practice of Surveying*.

#### COURSES IN HIGHWAY ENGINEERING

1.—HIGHWAY ENGINEERING. Spring term. Class work, three hours. Three credits.

The work in the class room is devoted to a study of the theory and practice of economic highway and pavement construction and maintenance, including a study of the needs of traffic, of its effect on the road surface, and of the materials of construction. Text, Baker's *Roads and Pavements*.

2.—HIGHWAY ENGINEERING I. Fall term. Four recitations a week and six hours in the laboratory. Seven credits.

The recitation work deals with the economics of highway location, construction and maintenance, dealing principally with country highways. The laboratory work is devoted to a study of the characteristics of the principal road-building materials and the standard methods of testing. Text to be selected.

3.—HIGHWAY ENGINEERING II. Winter term. Four recitations a week. Four credits. Prerequisite: Highway Engineering I.

This course is devoted principally to a study of the construction and maintenance of modern types of improved surfaces for roads and pavements. Texts to be selected.

4.—HIGHWAY ENGINEERING III. Spring term. Three recitations a week; eight hours of field and drawing-room work. Seven credits. Prerequisite: Highway Engineering II.

The recitation work is devoted to a study of road laws and administration in the various sections of the United States and Europe. The field and drawing-room work aims to give the student practice in making surveys for highways, mapping, making estimates and drawing up specifications. Texts to be selected.

5.—SPECIFICATIONS AND INSPECTION. Spring term. Two recitations. Two credits. Prerequisite: Highway Engineering II.

This is a course dealing with the matter of drawing specifications for various standard types of road construction and the inspections of materials and construction work. Text to be selected.

6.—ROAD MACHINERY LABORATORY. Fall term. Four hours laboratory work. Two credits.

The design of this course is to familiarize the student with the construction and use of machinery used in the construction and maintenance of roads.

## COURSES IN IRRIGATION AND DRAINAGE ENGINEERING

1.—DRAINAGE AND IRRIGATION I. Fall term. Class work, three hours. Three credits. Prerequisite: Hydraulics.

In this course a study is made of the application of engineering principles to the design and construction of drainage and irrigation works. Considerable attention is paid to the development of ground-water supplies for irrigation. Any senior engineering student may enter the course. Texts, Elliot's *Engineering for Land Drainage*, and Newell and Murphy's *Principles of Irrigation Engineering*.

2.—DRAINAGE AND IRRIGATION II. Winter term. Three recitations a week. Three credits. Prerequisite: Drainage and Irrigation I.

This is a library and textbook course dealing primarily with the agricultural side of drainage and irrigation. Among the questions considered are the amount of water required by different crops, the best time to apply water for different crops, the effect on various crops of the depth below the surface of ground water, methods of preventing the deposits of salts injurious to vegetation and of removing existing deposits of such salts. Text to be selected.

3.—DRAINAGE AND IRRIGATION III. Spring term. Field and drafting-room work, six hours. Three credits.

It is the aim of this course to give the student practice in the surveys for drainage and irrigation projects, plotting maps and drawing up specifications and estimates.

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Electrical Engineering

Professor \_\_\_\_\_  
Professor HAMILTON, in Charge  
Assistant Professor LANE  
Instructor MCNAIR

Instruction in this course is given by means of textbooks, lectures, and laboratory periods. The class work is carefully illustrated by means of demonstration apparatus and the projection lantern. The course is designed to provide the necessary preparation for young men who desire to engage in the practical field of electrical engineering, or for those who desire to assume the control of central stations as managers, as superintendents, or as consulting engineers.

The electrical laboratory for the work of the third year is provided with standard instruments of measurements, including standards of resistance, self-induction, capacity, etc. A complete line of standard makes of ammeters, voltmeters, wattmeters, and galvanometers is also provided. The different laboratories of the department are supplied with electric current from the following sources: 120-volt storage-battery circuit; 110-volt direct-current circuit; 110-volt alternating-current circuit; 220-volt direct-current circuit. Voltages up to 60,000 can be produced in the dynamo laboratory for testing purposes.

The electrical engineering laboratory is provided with a number of standard commercial machines, among them a 30-kilowatt 2300-volt polyphase alternating-current generator, a 15-kilowatt 125-volt alternating-current generator, a 7½-kilowatt synchronous converter, single and three-phase induction motors, a 5-horsepower phase-wound induction motor, a 20-horsepower auxiliary pole 220-volt direct-current motor,

a 26-horsepower 220-volt direct-current motor, a 15-kilowatt 125-volt generator, a 4½-kilowatt 125-volt direct-current generator, a Wood arc machine, a 60-cell 160-ampere-hour storage battery, current transformers, arc lamps, constant potential transformers, 20,000- and 60,000-volt testing transformers, marble and slate switchboards, a Tirrel regulator, speed controllers, and a full line of ammeters, voltmeters, wattmeters, etc., for testing purposes.

## COURSES IN ELECTRICAL ENGINEERING

1.—THEORY OF ELECTRICITY I. Junior year, fall term. Recitations and lectures, four hours; laboratory, two hours. Five credits. Prerequisites: Engineering Physics II; Calculus III.

This course is an extension of the work in electricity in Engineering Physics II, and is a prerequisite to work in electrical engineering proper. A study is made of the phenomena and fundamental laws and principles of static electricity, the galvanic current, magnetism, and electromagnetism. Emphasis is laid upon the ultimate importance to the student of a thorough understanding of these subjects. Text, Pender's *Principles of Electrical Engineering*.

*Laboratory.*—The laboratory course continues the work of the classroom in giving the application of the fundamental principles, the experiments being so arranged as to follow the theoretical development of the subject.

2.—THEORY OF ELECTRICITY II. Junior year, winter term. Recitations and lectures, three hours; laboratory, two hours. Four credits. Prerequisite: Theory of Electricity I.

This course is a continuation of the work begun in the fall term. It deals primarily with the general principles of electromagnetic induction, and gives an elementary treatment of alternating currents, including the effect of inductance and capacity. Text, Pender's *Principles of Electrical Engineering*.

*Laboratory.*—This work is a continuation of the laboratory work done in the preceding course, and gives the student a wide range of work in the use and manipulation of some of the higher-grade instruments used in electrical measurements.

3.—DIRECT-CURRENT MACHINES I. Junior year, winter term. Recitations or lectures, four hours; laboratory, four hours. Six credits. Prerequisite: Theory of Electricity II.

The work consists of a detailed study of the fundamental principles of magnetic and electric circuits and their application to the various types of direct-current machines. Numerous problems involving the application of the principles are given as a part of the course. The class work is planned to coordinate with the work in the electrical engineering laboratory. Text, Franklin and Estey's *Elements of Electrical Engineering*, Vol. I.

*Laboratory.*—A series of experiments is outlined which is designed to necessitate careful, accurate measurement. The student is obliged to make all electrical connections with the necessary instruments in the circuit and to record the required data. From the laboratory records a written report upon each experiment or test must be submitted. The laboratory exercises include tests for armature and field resistance, potential curves, machine characteristics, motor and generator efficiencies.

4.—DIRECT-CURRENT MACHINES II. Junior year, spring term. Lectures or recitations, four hours; electrical engineering laboratory, four hours. Six credits. Prerequisite: Direct-Current Machines I.

This course is a continuation of Direct-Current Machines I. It involves a detailed study of the various types of direct-current machinery with respect to theory and operation. The latter part of the course is devoted to a special examination of the different methods of testing generators and motors, and to the special application of the different classes of machines to commercial uses. Text, Franklin and Estey's *Elements of Electrical Engineering*, Vol. I.

*Laboratory.*—Special attention is given in this course to the different methods of determining generator and motor efficiencies and to the proper tabulation and interpretation of results.

5.—ELECTRICAL INSTRUMENTS AND CALIBRATION. Junior year, spring term. Lectures and recitations, two hours; calibration laboratory, four hours. Four credits. Prerequisites: Theory of Electricity I and II.

This course includes a study of the different types of electrical measuring instruments and their application to electrical engineering testing. Text, Roller's *Electric and Magnetic Measurements*, supplemented by lectures.

*Laboratory.*—The laboratory work in this subject includes the calibration of both direct- and alternating-current measuring instruments and their uses in measuring current, potential power, resistance, inductance, and capacity.

6.—DIRECT-CURRENT MACHINE DESIGN. Senior year, fall term. Lectures, two hours; computation, four hours. Four credits. Prerequisite: Direct-current Machines II.

The purpose of the course is to acquaint the student with the principles of commercial design of direct-current machinery. Each student is required to make the necessary calculations and drawings for a direct-current generator.

7.—ALTERNATING-CURRENT MACHINES I. Senior year, fall term. Recitations or lectures, four hours; laboratory, four hours. Six credits. Prerequisites: Calculus III, Theory of Electricity II.

The work consists of a mathematical treatment of alternating-current phenomena. A study is made of the vector method of treating alternating-current problems. The solution of problems involving single and polyphase circuits forms an important part of the course. Text, Franklin and Estey's *Elements of Electrical Engineering*, Vol. I; Swenson and Frankenfield's *Testing of Electromagnetic Machinery*.

*Laboratory.*—It is the aim of this course to provide a series of experiments illustrating the theoretical work of the lecture room. Practice is given in the accurate measurement of capacity and inductance, and the effect of each upon the circuit. The latter part of the course is devoted to a study of polyphase circuits.

8.—ELECTRICAL ENGINEERING M-I. Senior year, fall term. Lectures or recitations, four hours; laboratory, two hours. Five credits. Prerequisites: Engineering Physics II and Calculus III.

This course covers the subject of direct-current machines with reference to the fundamental laws of the electric circuit; the principles of direct-current machinery; and the more important commercial tests. Text, Sheldon's *Direct-Current Machines*.

*Laboratory.*—Practice is given in the proper use of electrical measuring instruments. The experiments include a variety of tests requiring accurate observation, and a knowledge of the theory of dynamo machines. The various standard characteristic and efficiency tests are given. A written report on each test is required.

9.—ELECTRICAL ENGINEERING M-II. Senior year, winter term. Lectures and recitations, four hours; laboratory, two hours. Five credits. Prerequisites: Engineering Physics II; Calculus III.

The work covers briefly the important principles of alternating-current phenomena. The leading types of alternating-current machinery and apparatus are discussed with reference to their operation and their adaptability to different classes of service. Text, Sheldon's *Alternating-Current Machines*.

*Laboratory.*—The experimental work in this course includes practice in the use of alternating-current instruments; standard tests of alternators, motors, and transformers; and methods of operating the different types of alternating-current machinery.

10.—ALTERNATING-CURRENT MACHINES II. Senior year, winter term. Recitations or lectures, four hours; laboratory, four hours. Six credits. Prerequisite: Alternating-Current Machines I.

This is a continuation of Alternating-Current Machines I. The course consists of a study of the theory of alternating-current machinery, alternators, synchronous motors, induction motors, transformers, and the various devices used in connection with alternating-current work. A study is also made of the application of the different types of machinery to industrial uses. Text, Franklin and Estey's *Elements of Electrical Engineering*, Vol. II; Swenson and Frankenfield's *Testing of Electro-Magnetic Machinery*.

*Laboratory.*—This laboratory course consists of a series of experiments involving special and commercial tests of alternators, synchronous motors, transformers, and the different types of alternating-current machinery and apparatus.

11.—ILLUMINATING ENGINEERING. Senior year, spring term. Lectures or recitations, two hours; laboratory, two hours. Three credits.

This course is devoted to a study of photometry and light standards and the principles of illumination. The different types of incandescent and arc lamps are discussed with reference to their efficiency and adaptability to different classes of lighting. Systems of street illumination are also studied.

12.—TELEPHONE ENGINEERING. Senior year, winter term. Class work, three hours; laboratory, two hours. Four credits.

This course consists of a consideration of the principles of acoustics and alternating phenomena involved in telephone practice. A detailed investigation is made of telephone apparatus and circuits, with reference to their adaption to various kinds of telephone service. This is followed by a study both of the design and maintenance of telephone lines and central-office apparatus, and of central-office methods, the selection of apparatus, and methods of handling telephone traffic. Text, Abbott's *Telephony*.

13.—ELECTRICAL ENGINEERING C. Senior year, spring term. Recitations or lectures, three hours; laboratory practice, two hours. Required in the course in civil engineering. Prerequisites: Engineering Physics III; Calculus III.

This work is designed to cover briefly the fundamental principles of direct-current and alternating-current machinery. Emphasis is laid upon the proper installation and operation of the different classes of machines.

*Laboratory.*—The laboratory practice is designed to give the student a knowledge of the most important commercial tests. The proper use of electrical instruments is emphasized. A written report of each laboratory test is required.

14.—ALTERNATING-CURRENT MACHINE DESIGN. Senior year, spring term. Lectures, one hour; laboratory, two hours. Two credits. Prerequisite: Alternating-Current Machines II.

This course embraces the elementary principles underlying the design of alternating-current apparatus. Students are required to make calculations and drawings for an alternating-current machine.

15.—GENERATION AND DISTRIBUTION OF ELECTRICAL ENERGY. Senior year, spring term. Recitations or lectures, four hours. Four credits.

This course is designed to cover station operation and management, methods of power transmission, and systems of distribution. Each student is assigned an important electrical power station, upon which a detailed written report is required. Text, Ferguson's *Elements of Electrical Transmission*.

16.—POWER PLANT DESIGNS AND SPECIFICATIONS. Senior year, spring term. Lectures, one hour; laboratory, six hours. Four credits.

This work relates to the design and equipment of a modern power plant. Complete specifications for the necessary machinery and apparatus, with drawings showing the plan of the building and the location of the machinery and apparatus, are required.

17.—POWER AND LIGHTING. Senior year, spring term. Class work, three hours; laboratory, two hours. Four credits.

The work is planned to cover briefly the principles of illumination, the proper distribution of lighting units, photometric measurements, and inspection work, as based on the *National Electric Code*.

18.—SEMINAR E-I, E-II. Junior year, fall and winter terms, and senior year, winter term, respectively. The first course has one hour of class work with one credit; the last is a two-hour course with two credits.

The work of this course is intended to give students of electrical engineering the opportunity to keep informed regarding the latest inventions and research work along the special line which they have chosen. Reviews of current electrical literature are required, and class discussions of articles reviewed are made the basis of the class work.

19.—THESIS. Required in the course in electrical engineering.

The selection of a subject for thesis work, in consultation with the head of the department, is made at the beginning of the winter term. The work is continued during the winter and spring terms. Every opportunity is given the student to work out original ideas as to design or operation.

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## Printing

Superintendent STROTHER  
Assistant ALLEN

The Department of Printing had its inception when *The Kansas Industrialist* was established, in 1875. The demands made upon the department have necessitated a gradual increase in equipment and facilities, until at present it occupies the entire first floor and basement of Kedzie Hall. In addition to printing and mailing *The Kansas Industrialist* each week during the College year, the large amount of general printing for the numerous departments of the College furnishes a wide range of work and keeps the plant in constant operation during the entire twelve months.

From the beginning, printing-trade practice has been offered to students, as the facilities of the department make possible.

COMPOSING ROOM. The equipment consists of ten racks of body type, two dumps, galley racks, proof press, ten cabinets of display type, five imposing stones, two lead and slug racks, make-up rack, ink stones, galleys, chases, and other accessories.

**FOLDING AND STOCK ROOM.** The equipment consists of tables for hand folding, two wire-stitching machines, one 32-inch power paper cutter, one 26-inch hand cutter, one interchangeable perforating, punching, and round-cornering machine, racks for storing stock, and other necessary appliances.

**PRESSROOM.** The equipment consists of one two-revolution cylinder press, one drum-cylinder press, three platen presses, one imposing stone, drying racks, tables, trucks, and other accessories. All machines requiring power are driven by individual electric motors.

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## Shop Practice

Associate Professor CARLSON  
 Instructor HOUSE  
 Instructor HOLLAN  
 Instructor HAYES  
 Instructor GRANT  
 Assistant YOST  
 Assistant PARKER  
 Assistant TURNBULL  
 Assistant LATHROP  
 Assistant BALL  
 Assistant BRAKEMAN  
 Assistant ———

The work in the shops is planned to meet the needs of three classes of students: (1) those in the course in agriculture who expect to use the skill gained in the shops in their after work on the farm; (2) those in the manual-training option of the course in general science who need to secure a sufficient knowledge of the principles underlying shop work, and sufficient skill in the performance of various operations, to be able to instruct others; (3) those in the courses in engineering whose need is to secure a thorough knowledge of the methods of performing various kinds of shop work; of the machine best suited for the different purposes; of the amount of work that may be expected of the different machines and from the workmen under different conditions.

The equipment of the Department of Shop Practice is set forth to a certain extent below.

**WOOD SHOP.** This room is 40 by 90 feet; it contains 252 separate sets of tools, and benches for 60 students in each class.

**PATTERN SHOP.** This room is 45 by 81 feet, and contains sixteen ten-inch by four-and-one-half-foot wood-turning lathes and one eighteen-inch by twelve-foot J. A. Fay & Co. pattern makers' lathe fully equipped with tools and chucks; eight pattern makers' double benches, equipped with rapid-acting vises and a complete set of tools.

**WOODWORKING MACHINERY ROOM.** This room is 35 x 42 feet, and contains one Dietzwell wood planer, one Cordsman Meyers friezer, one thirty-four-inch band saw, one Beach jig saw, one Fay Combination circular saw, one Fay & Egan power mortiser, one Fay & Egan sandpapering machine, one K. S. A. C. sensitive drill, one Seneca Falls foot mortiser, besides the necessary grindstones and work benches.

**MACHINE SHOP.** This room is 40 by 170 feet, and contains thirteen engine lathes, as follows: One fourteen-inch Hendey-Norton lathe, two fourteen-inch Flather lathes, one thirteen-inch Lodge & Davis lathe, one sixteen-inch Lodge & Shipley combination engine and turret lathe, two fourteen-inch Reed lathes, five fourteen-inch K. S. A. C. lathes, and one



twenty-eight-inch by twenty-foot American lathe equipped with block to raise it to sixty-inch swing, one K. S. A. C. speed lathe, one Brown & Sharp No. 2 universal milling machine, one K. S. A. C. (Hendey-Norton pattern) shaper, one K. S. A. C. (Pratt & Whitney patterns) shaper, one Gray twenty-six-inch by six-foot planer, one Niles fifty-one-inch vertical turning and boring mill, one Baker Bros. key seater, one Barnes thirty-four-inch self-feed drill press, one Rogers twelve-inch sensitive drill press, two K. S. A. C. twelve-inch sensitive drill presses, one K. S. A. C. (Bemis Miles patterns) twenty-inch double-traverse quick-return shaper, two Morse & Dexter valve reseating machines, one Walker universal grinder, one K. S. A. C. special drill grinder, one power hack saw, one Emerson direct-connected motor polishing machine, one bolt and pipe machine taking pipe up to two inches, one pipe machine taking pipe up to eight inches, benches and tools for fifty students, and a tool room completely stocked with the necessary tools.

**BLACKSMITH SHOP.** This room is 50 x 100 feet, and is equipped with thirty-three Sturtevant down-draft forges for students' use and two large special Sturtevant forges for general use. Each forge has anvil and complete set of forging tools, and is supplied with forced draft and power exhaust. In addition to the general tools for a fully equipped blacksmith shop, there is also installed a drill press, punch and shear, emery grinder, tire bender, tire shrinker, and a number of pieces of special apparatus built by the department.

**IRON FOUNDRY.** This room is 27 x 100 feet. It is equipped with a one-and-one-half-ton Calliau cupola, one-and-one-half-ton K. S. A. C. steel crane, core oven five by six by seven feet (arranged so that it can be heated with either coke or gas), one car, track and turntable, one two-by-three-foot K. S. A. C. rumbler, one K. S. A. C. emery grinder, one K. S. A. C. molding machine, an exceptionally large number of flasks, both wood and iron, ladles, etc.

**BRASS FOUNDRY.** This room is 24 x 34 feet. It is equipped with one twenty-one by thirty-six-inch brass furnace, crucibles, flasks, molding tubs, benches, cases, racks and all necessary tools for bench and floor molding.

**AMPHITHEATER.** This room is 54 x 54½ feet. It is adjacent to the blacksmith shop and iron and brass foundries, and is equipped with forge, anvil and forge tools, bench, molding trough and molding tools, black-board, etc., for lectures and demonstration work.

**LOCKER ROOM.** This room is 36 x 40 feet. It is conveniently located, and is equipped with 244 special metal lockers for the use of students taking work in the machine shop, blacksmith shop, foundry and engineering laboratory. A portion of this is made a separate locker-room and bath-room for the use of the shop foreman, and contains seven metal lockers.

#### COURSES IN SHOP PRACTICE

1.—BLACKSMITHING I. Lecture, one hour; shop work, four hours. Three credits.

This is a course in the forging of iron, and is designed to teach the principles and operations of drawing, bending, upsetting, welding, twisting, splitting, and punching. A study is made of the manufacture of iron and steel, composition and heat treatment of steel, and of the proper methods of making forgings and tools. Tools required: a two-foot rule and a pair of five-inch outside calipers.

2.—BLACKSMITHING II. Shop work, four hours. Two credits. Prerequisite: Blacksmithing I.

Advanced work in the forging of iron and in the manufacture of steel tools. Instruction is given in hardening, tempering, case-hardening and annealing. Tools required: same as Blacksmithing I.

3.—FOUNDRY. Lecture, one hour; shop work, four hours. Three credits.

Practice is given in floor, bench and machine molding, in core making, and in casting in iron, copper, brass, and special alloys. A study is also made of modern foundry construction, equipment, materials and methods.

4.—PATTERN MAKING. Lecture, one hour; shop work, four hours. Three credits. Prerequisite: Foundry.

This course comprises a series of exercises embodying the principles governing pattern construction in making plain and split patterns, including core prints and core boxes, after which practical patterns are made of machines and machine parts.

5.—MACHINE SHOP I. Shop work, four hours. Two credits. Prerequisite: Foundry.

Practice is given in chipping, filing, shaper and planer work, scraping, drilling, and the cutting of right-hand, left-hand, and double threads, and knurling on the lathe. Tools required: a four-inch scale or (B. & S.) slide caliper, a nine-inch combination set No. 7 graduation, one pair five-inch outside calipers, one pair five-inch inside calipers, one center drill, one center gauge (B. & S.), and one pair of three-inch dividers.

6.—MACHINE SHOP II. Shop work, four hours. Two credits. Prerequisite: Machine Shop I.

This course consists of progressive problems in turning and calipering, boring, reaming and taper turning and threading on the lathe, exercises in chucking, the use of forming tools, practice on key-seating machine. A spur gear is made on the milling machine. A study is also made of cutting edges and tool adjustments best suited to the different metals, together with a study of cutting speeds and feeds.

7.—ADVANCED WOODWORK. Lecture, one hour; shop work, four hours. Three credits. For students in the course in architecture.

This is a course in bench and machine work in making some of the more common building details, such as porch newels and rails, plain and fancy moldings, cornices, etc.

8.—MACHINE SHOP III. Lecture, one hour; shop work, four hours. Three credits. Prerequisite: Machine Shop II.

This course takes up work on the turret lathe and boring mill. Practical work is also given with jigs, templets, and a study made of the rapid production of duplicate parts, belts, lacings, and methods of belt connections, compound and differential indexing, and the cutting of spiral gears on the milling machine.

9.—WOODWORK III-G. Lectures and recitations, two hours; shop work, eight hours. Six credits. Elective in the course in general science.

A course is given in woodworking suitable for use in the upper grammar and high-school grades. Each student completes a set of exercises suitable for those grades. Models showing progressive steps are made for the purpose of illustrating the proper methods of procedure in working out the different exercises. A study is made of the selection and cost of the equipment and material used in this work.

10.—MACHINE SHOP IV. Lectures, one hour; shop work, six hours. Four credits. Prerequisite: Machine Shop III.

The time of this course is devoted to the construction of complete machines and machine parts, from drawings and blue-prints. A study will be made of the different machine tools from assigned catalogue work, with regard to the economical and efficient production of different classes of product.

11.—WOODWORK IV-G. Lectures and recitations, one hour; shop work, four hours. Three credits. Elective in the course in general science. Prerequisite: Woodwork III-G.

This is a continuation of Woodwork III-G, with a study of cabinet construction best adapted to high-school grades. The work of this term includes a course in wood carving, in sinking backgrounds and in modeling curved surfaces. The course includes a study of the proper application of carving in ornamental articles of use.

12.—WOOD TURNING G. Lectures and recitations, one hour; shop work, four hours. Elective in the course in general science. Prerequisite: Woodwork III-G.

Exercises are first given in turning cylinders, cones, convex and concave curves, which involve the use of different wood-turning tools. The course involves turning between centers, on faceplates, and by means of hollow chucks. Some of the articles made are tool handles, dumb-bells, towel rings, typical vase forms, cups, goblets, etc. Tools required: one two-foot rule, one pair of three-inch dividers, one pair of five-inch outside calipers, one pair of five-inch inside calipers.

13.—MACHINE SHOP V. Shop work, supplemented by lectures, four hours. Two credits. Prerequisite: Machine Shop IV.

This course is a continuation of Machine Shop IV, with practice in the making of taps, reamers, twist drills, dies and tool-making work.

14.—MACHINE SHOP VI. Shop work, supplemented by lectures, four hours. Two credits. Prerequisite: Machine Shop V.

This is a continuation of Machine Shop V, with practice in the grinding of reamers, and milling cutters, and general tool work.

15.—BLACKSMITHING III-G. Lectures and recitations, one hour; shop work, four hours. Three credits. Elective in the course in general science. Prerequisite: Blacksmithing II.

Special drill in forge work is given in order to impart skill in the different operations. Progressive steps of different exercises are worked out, in order to illustrate the method of their construction.

16.—BLACKSMITHING IV-G. Lectures and recitations, one hour; shop work, two hours. Two credits. Elective in the course in general science. Prerequisite: Blacksmithing III-G.

This comprises a study of ornamental forge work in designing and making articles such as jardiniere stands, andirons, hinges, escutcheons, etc. A portion of the time is devoted to hammered metal work. Problems are worked out in copper and brass, which brings into use typical tools and operations in the handling of sheet metal.

17.—MACHINE SHOP III-G. Lectures and recitations, one hour; shop work, four hours. Three credits. Elective in the course in general science. Prerequisite: Machine Shop II.

A course in machine-shop metal working, adapted to the conditions frequently found in high schools. A study is made of the selection of machines, tools, and general supplies; the proper arrangement of the shop, the location of shafting, and other shop problems.

## COURSES IN FACTORY ENGINEERING

1.—FACTORY ENGINEERING. Senior year. Winter term. Lectures and recitations, two hours. Two credits.

This course considers the selection of a locality and site for shops and manufacturing establishments; the grouping and design of the buildings, including the study of slow-burning and fire-proof construction; systems of illumination; equipment for the different departments; the methods of handling the raw material, from the point of its receipt through the several departments to the completion of the finished product, with the least amount of doubling back; methods of manufacturing. Text, Kent's *Mechanical Engineer's Pocketbook*. Prerequisites: Applied Mechanics III; Business Organization.

2.—FACTORY DESIGN. Senior year. Spring term. Drafting-room work, four hours. Two credits.

The knowledge gained in the shops and laboratories is applied to the design of a factory, shop or mill. Prerequisite: Factory Engineering.

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## Steam and Gas Engineering

Professor POTTER  
Instructor SIMMERING  
Assistant SANDERS  
Assistant KNAPP

The object of the instruction in this department is to give to the student the fundamental principles underlying the design, construction, selection, operation and testing of steam boilers, steam engines, and steam turbines; gas producers; gas and petroleum engines; compressed-air and refrigerating machinery; condensers and evaporators. These subjects are developed by thorough courses in engineering thermodynamics and in steam and gas engineering, and are followed in the fourth year by courses in power-plant engineering, in refrigeration, and in heating and ventilation. The classroom instruction of every course consists of lectures and recitations, which are paralleled by work in the drafting room and laboratory, and supplemented by numerous practical problems, trade catalogues, notes, and inspection trips requiring written reports.

### STEAM ENGINEERING LABORATORY

In addition to the equipment installed especially for experimental purposes, all the heating, power, ventilating, and pumping equipment of the College subserves the further purpose of experimental work.

There are available for boiler tests three 125-horsepower high-pressure fire-tube boilers equipped with under-feed, chain-grate, and sight-feed stokers; two high-pressure water-tube 250-horsepower boilers, one being equipped with a Roney stoker and the other for hand firing. Besides the five high-pressure boilers, there are eight low-pressure boilers equipped with under-feed stokers. All of these boilers have full equipment of auxiliaries and are provided with pyrometers, draft gauges, flue-gas samplers, and other instruments for research and laboratory work.

The steam engineering laboratory contains eight steam engines with different types of valve gears, including plain slide valves, balanced valves, double valves, piston valves, Corliss valves. These engines range in power from six to two hundred and fifty horsepower. There is also a 300-horsepower De Laval steam turbine equipped with a surface condenser, dry vacuum pumps, wet vacuum pumps, and circulating pumps. A little compound reciprocating steam engine is also equipped so that it can be operated condensing or noncondensing. The engines in this laboratory are equipped with electric generators or with absorption brakes, the Corliss engine being provided with an Alden water brake.

The laboratory is also provided with various types of steam pumps, steam traps, and coal calorimeters, indicators, gauges, injectors, planimeters, pyrometers, and apparatus for testing gauges, indicators, and lubricants. Furthermore, the College has several types of steam traction engines and a road roller.

## GAS ENGINEERING LABORATORY

The apparatus for gas engineering work includes two complete producer plants, with various types of scrubbers, saturators, blowers, a Carpenter coal calorimeter, a Junkers gas calorimeter, two types of pyrometers, and many different types of gas and oil engines, fans, a complete compressed-air plant, consisting of a steam engine, air compressors, and an air motor, Venturi and Pitot tubes, gas meters, and other small apparatus.

The College owns a gasoline tractor, and, through the courtesy of manufacturers, has on hand at all times several types of gasoline and oil traction engines.

## COURSES IN STEAM AND GAS ENGINEERING

1.—STEAM AND GAS ENGINEERING I. Fall term. Lectures and recitations, four hours. Four credits. Prerequisite: Kinematics I.

A descriptive study of steam boilers, steam engines, and steam turbines. A study of the various types of fire-tube and water-tube boilers, reciprocating steam engines and turbines, valve gears, governors, and details of construction and operation. Texts: Peabody's *Valve Gears*; Peabody and Miller's *Steam Boilers*; Notes.

2.—STEAM AND GAS ENGINEERING II. Winter term. Lectures and recitations, three hours; laboratory, two hours. Four credits. Prerequisite: Steam and Gas Engineering I.

This is a continuation of the work given under Steam and Gas Engineering I, as well as a descriptive study of gas and oil engines, and gas producers, including carbureters, vaporizers, ignition systems, gas-engine governors, etc. Texts: Peabody & Miller's *Steam Boilers*; Jones' *Gas Engine*.

3.—STEAM AND GAS ENGINEERING III. Spring term. Lectures and recitations, three hours; laboratory, two hours. Four credits. Prerequisites: Steam and Gas Engineering; Calculus III.

A study of engineering thermodynamics, including the application of laws of gases and vapors to various thermodynamic cycles. Text, Ennis' *Applied Thermodynamics for Engineers*.

4.—STEAM AND GAS ENGINEERING IV. Fall term. Lectures and recitations, three hours; laboratory, two hours. Four credits. Prerequisite: Steam and Gas Engineering III.

A continuation of the work given in Steam and Gas Engineering III, including thermodynamic design of reciprocating steam engines, turbines, and internal-combustion motors, heat-engine economics and specifications. Text, same as Steam and Gas Engineering III, and notes.

5.—STEAM AND GAS ENGINEERING V. Winter term. Lectures and recitations, three hours; laboratory, two hours. Four credits. Prerequisite: Steam and Gas Engineering IV.

The course includes a study of solid, liquid and gaseous fuels for use in internal-combustion engines; of methods of refining crude petroleum; of manufacture of water gas, producer gas, coal gas, oil gas, including various scrubbing systems and gas-plant auxiliaries; of thermodynamic and physical properties of various commercial gases.

6.—STEAM AND GAS ENGINEERING E-I. Fall term. Lectures and recitations, four hours; laboratory, two hours. Five credits. Prerequisites: Kinematics; Calculus III.

This is a descriptive study of steam engines, boilers, and steam power-plant auxiliaries. The course includes a study of elementary thermodynamic principles of gases and vapors. Text, Allen & Bursley's *Heat Engines*.

7.—STEAM AND GAS ENGINEERING E-II. Winter term. Lectures and recitations, four hours; laboratory, two hours. Five credits. Prerequisite: Steam and Gas Engineering E-I.

Elementary thermodynamic principles applied to the study of the internal-combustion engine, and a descriptive study of gas engines, oil engines, and gas producers. Selection of prime movers for electric power plants, and the economics of the electric power-plant prime mover. Text, Jones' *Gas Engines*.

8.—STEAM AND GAS ENGINEERING C. Fall term. Lectures and recitations, three hours; laboratory, two hours. Four credits. Prerequisites: Kinematics; Calculus III.

A descriptive study of steam boilers, steam engines, steam turbines, and gas and oil engines, including the various auxiliaries. Text, Allen & Bursley's *Heat Engines*.

9.—FARM MOTORS I. Winter term. Lectures and recitations, two hours; laboratory, four hours. Four credits.

A descriptive study of steam engines, boilers, gas and oil engines, with special reference to their utilization on the farm. Text Potter's *Farm Motors*.

10.—FARM MOTORS II. Lectures and recitations, two hours; laboratory, two hours. Three credits. Prerequisite: Farm Motors I.

A continuation of the study of farm motors, including water motors, windmills, electric motors, and traction engines. Text, Potter's *Farm Motors*.

11.—TRACTION ENGINES. Lectures and recitations, one hour; laboratory, four hours. Three credits. Prerequisite: Farm Motors II.

A study is made of the details of construction, operation and testing of the various types of steam and oil traction engines.

12.—REFRIGERATION. Spring term. Lectures and recitations, two hours; laboratory, two hours. Three credits. Prerequisite: Steam and Gas Engineering IV, or Steam and Gas Engineering E-II.

This is a study of the practical details of compression and absorption refrigerating systems, including auxiliaries, refrigerating mediums, insulation, and applications of refrigeration to ice-making, cold storage, and the cooling of air, liquids, and solids. Text, Macintire's *Refrigeration*.

13.—POWER PLANT ENGINEERING. Winter term. Lectures and recitations, two hours. Two credits. Prerequisites: Steam and Gas Engineering IV; Hydraulic Machinery.

A study of complete power plants, including steam-electric, gas-electric, and hydro-electric power plants. In this course the knowledge obtained, through the study of the various prime movers and auxiliaries, is applied to the complete power plant. Text: Meyers' *Power Plants*; and notes.

14.—POWER PLANT DESIGN. Drafting room work, four hours. Two credits. Prerequisite: Power Plant Engineering.

A design of a complete power plant, including the location of prime movers and auxiliaries. In connection with this course the student makes a careful study of load conditions, location of plant, and other details.

15.—HEATING AND VENTILATION. Spring term. Lectures and recitations, two hours; laboratory and drafting room work, two hours. Three credits. Prerequisite: Steam and Gas Engineering IV.

This course is planned to acquaint the students with the fundamental principles of heating and ventilation, including direct and indirect systems, hot water, hot air, and steam systems of heating; advantages of various heating systems. In the designing room heat systems for dwellings, shops, power plants, and schools are considered. Text, Hoffman's *Heating and Ventilation*.

#### COURSES IN STEAM AND GAS ENGINEERING LABORATORY

Text, Carpenter and Diederich's *Experimental Engineering*.

1.—STEAM AND GAS ENGINEERING II LABORATORY. Winter term. Two hours a week. One credit. This must be taken in connection with Steam and Gas Engineering II.

This course includes the study and testing of gauges, indicators, simple steam engines and steam engine auxiliaries. Valve setting and manipulation of steam engines.

2.—STEAM AND GAS ENGINEERING III LABORATORY. Spring term. Two hours a week. One credit. This must be taken in connection with Steam and Gas Engineering III.

Calibration and use of calorimeters, traps, injectors. Flue gas analysis, manipulation and testing of gas and oil engines are the studies of this course. Prerequisite: Steam and Gas Engineering II Laboratory.

3.—STEAM AND GAS ENGINEERING IV LABORATORY. Fall term. Two hours a week. One credit. This must be taken with Steam and Gas Engineering IV.

This course includes thermal analyses of solid, liquid and gaseous fuels; engine and boiler room practice; evaporation tests on boilers; complete tests of steam engines and turbines; A. S. M. E. codes. Prerequisite: Steam and Gas Engineering III Laboratory.

4.—STEAM AND GAS ENGINEERING V LABORATORY. Winter term. Two hours a week. One credit. This must be taken with Steam and Gas Engineering V.

Complete tests are made on gas and oil engines, gas producers, water gas plants. Research work is done on explosive mixtures with various gas engine fuels. Air compressors, fans and blowers are also tested.

5.—STEAM AND GAS ENGINEERING E-I LABORATORY. Fall term. Two hours. One credit. This is taken in connection with Steam and Gas Engineering E-I.

This course includes the testing of indicators, gauges, steam engines; the use of steam calorimeters and steam meters; valve setting and manipulation of steam engines.

6.—STEAM AND GAS ENGINEERING E-II LABORATORY. Winter term. Two hours. One credit. Taken in connection with Steam and Gas Engineering E-II.

The course comprises manipulation and testing of gas and oil engines; engine room and boiler room practice; evaporation tests of steam boilers, steam turbine tests. Prerequisite: Steam and Gas Engineering E-I Laboratory.

7.—STEAM AND GAS ENGINEERING C LABORATORY. Fall term. Two hours. One credit. This is taken in connection with Steam and Gas Engineering C.

This course includes the handling of steam and gas engines; boiler and engine room practice; the use of steam calorimeters, indicators; simple tests on steam and gas engines.

8.—FARM MOTORS I LABORATORY. Winter term. Four hours. Two credits. This is taken in connection with Farm Motors I.

A study is made of the construction, manipulation and testing of various types of farm motors, including steam engines and boilers, gas and oil engines, water motors, and windmills.

9.—FARM MOTORS II LABORATORY. Spring term. Two hours. One credit. Taken in connection with Farm Motors II.

This is a continuation of the work given in Farm Motors I Laboratory, including the operation of electric motors and traction engines. Prerequisite: Farm Motors I Laboratory.

10.—TRACTION ENGINE LABORATORY. Fall term. Four hours. Two credits.

The course comprises the operation and testing of steam and oil traction engines for belt work, road work, and field work. Prerequisite: Farm Motors II and laboratory.

11.—REFRIGERATION LABORATORY. Spring term. Two hours. One credit. This must be taken with Refrigeration.

Part of the time is given to tests on refrigerating mediums and tests on refrigerating and ice making plants. The second half of the term is devoted to a design of a refrigerating plant.

12.—GAS ENGINES. Elective. Fall, winter, or spring term. Lecture, one hour; laboratory, four hours. Three credits.

This course is designed to teach the operation, care and repair of small stationary gas and oil engines.

### SHORT COURSES IN MECHANIC ARTS

The following short courses are intended for men who wish to gain a practical knowledge of the work indicated. Each of the courses is ten weeks long, and is offered in the winter term.

#### SHORT COURSE IN STEAM AND GAS TRACTION ENGINES.

This course is intended for those who have not the time or the means to take any of the regular technical engineering courses in the College, but who wish to obtain a practical working knowledge of stationary and traction steam and gas engines. The work of the course is shown in the following tabulation:

Steam Engines, Boilers, and Steam Traction Engines
8 (2-12)
Gas Engines and Gas Traction Engines
7 (1-12)
Blacksmithing
3 (1-4)
Machine Shop Practice
4 (0-8)
Mechanical Drawing
2 (0-4)



# SHORT COURSE IN SHOP WORK

This is a course designed for men who wish to gain a working knowledge of machines, tools, and methods which are used in the general repair shops. The subjects taught are shown below.

Blacksmithing  
6 (2-8)  
Foundry  
3 (1-4)  
Machine Shop  
6 (0-12)  
Woodwork  
4 (0-8)  
Gas and Oil Engines  
3 (1-4)  
Mechanical Drawing  
2 (0-4)

# SHORT COURSE IN CEMENT CONCRETE CONSTRUCTION

This course is designed for builders and others wishing to gain a general practical knowledge of concrete construction. The subjects considered are as tabulated here.

Concrete Construction  
9 (3-12)  
Concrete Materials and Tests  
4 (1-6)  
Concrete Drawing and Design  
3 (0-6)  
Form Construction and Framing  
3 (1-4)  
Gas Engines and Concrete Mixers  
3 (1-4)  
Mechanical Drawing  
2 (0-4)

# SHORT COURSE IN ROAD BUILDING, IRRIGATION AND DRAINAGE

This course, a tabulation of which is shown below, is designed for county engineers and surveyors.

Surveying  
3 (1-4)  
Highway Engineering  
3 (3-0)  
Irrigation and Drainage Engineering  
3 (3-0)  
Road Machinery and Materials Laboratory  
2 (0-4)  
Bridge and Culvert Construction  
6 (3-6)  
Concrete Construction  
3 (1-4)  
Specifications and Contracts,  
Road Laws and Administration  
2 (2-0)  
Mechanical Drawing  
2 (0-4)

## SUBJECTS TAUGHT IN THE MECHANIC ARTS SHORT COURSES

### CONCRETE

1.—CONCRETE CONSTRUCTION. Class work, three hours; laboratory, twelve hours.

Instruction in the selection of materials and proper proportions for different kinds of concrete construction, and in the essential principles of forming for, and of mixing and placing concrete.

Laboratory work consists of practice in the making of a variety of concrete objects, as fence posts, building blocks and other molded specimens, of concrete sidewalks, floors, water tanks, machine foundations, of stucco and plastered work, etc.

2.—CONCRETE MATERIALS AND TESTS. Class work, one hour; laboratory, six hours.

A study of properties and tests of cement, sands, gravels and broken stone. Standard tests are made to determine the fineness, soundness and strength of cement, the percentage of voids and foreign matters in sand and stone and the effect of variation in these properties upon the strength of concrete.

3.—CONCRETE DRAWING AND DESIGN. Drafting room practice, six hours.

Exercises in drawing designed to teach the student to read simple working drawings and to enable him to make such drawings of simple proposed constructions, especially of concrete. Practice in the use of rules and tables to determine the size of beams, slabs, and columns, and the amount of reinforcing required in reinforced concrete.

### STATIONARY AND TRACTION STEAM AND GAS ENGINES

1.—STEAM ENGINES, BOILERS, AND STEAM TRACTION ENGINES. Class work, three hours; laboratory, twelve hours.

A study of steam boilers and auxiliaries; types of boilers, grates for boilers, piping, pipe fittings, valves, putting in flues, steam gages, steam traps, pumps and injectors, firing, management of boilers. Stationary steam engines; types of engines, valves and valve setting, engine auxiliaries, installation, repairs and care of steam engines. Traction engines; fundamental parts, differentials, care and management of traction engines.

2.—GAS ENGINES AND GAS TRACTION ENGINES. Class work, two hours; laboratory, eight hours.

A study of gas and oil engines; four-stroke, and two-stroke cycle engines, gas engine fuels, carbureters, ignition systems, selection, erection, and care of gas engines; gas engine repairs. Gas Traction engines.

3.—GAS AND OIL ENGINES. Class work, one hour; laboratory, four hours.

A study of two-stroke and four-stroke cycle gas and oil engine; fuels; mechanical details. Selection and handling of gas and oil engines.

### SHOP WORK

1.—BLACKSMITHING. (For Short Course in Shop Work.) Two hours of class work; eight hours of laboratory work a week.

A course in the forging of iron and steel such as will give a general knowledge of the methods of working and handling these metals. The class work will consist of a study of the manufacture of cast iron, wrought iron, mild steel, and of the proper use and method of working each.

2.—BLACKSMITHING. (For Short Course in Traction Engines.) Class work one hour; laboratory, four hours. Three credits.

This is a course in iron and steel work designed to give the student a knowledge of the manufacture of iron and steel and the proper methods of handling it in the forge shop. Exercises are given in drawing, upsetting, bending, twisting, punching, welding in iron and machinery steel, and also exercises in forging, hardening and tempering tool steel.

3.—MACHINE SHOP. (For Short Course in Shop Work.) Shop work supplemented by lectures, sixteen hours a week.

A course in machine work to give a good working knowledge of a variety of machine operations such as chipping, filing, scraping, drilling, shaper and planer work, lathe work in cutting various threads, key-seating, soldering, brazing, babbiting, lacing belts, aligning shafting and pulleys, cutting and threading pipe, and in making general repairs on a variety of machinery.

4.—MACHINE SHOP. (For Short Course in Traction Engines.) Laboratory, eight hours.

This course in machine work is to give the student practice in chipping, filing, drilling, babbiting and adjusting bearings, and in making general repairs to machinery; practice will also be given in cutting and fitting pipes, and in soldering and brazing, belt lacing, etc.

5.—FOUNDRY. Class work, one hour; laboratory, six hours.

This course consists of bench and floor molding, with a great variety of patterns, along with which the student gets experience with different kinds of sand and facings; also, open sand work, sweep molds, and instruction in machine molding, core making, setting of cores, gates and risers, and different methods of venting, etc. The lectures consist of practical talks on the materials used in the foundry, the selection of sand, methods of venting, drying and handling of molds, cores, etc., for the various classes of work; also discussions on the handling of the cupola, and the grading and mixing of the irons suitable for different classes of work. Special emphasis in all cases being laid upon the practical side of work.

6.—WOODWORK. Laboratory, eight hours.

Elementary principles of carpentry, framing and cabinet work.

7.—FORM CONSTRUCTION AND FRAMING. Class work, one hour; laboratory, four hours.

A study of the fundamental factors to be taken into consideration in the construction of buildings, as the building site, laying out and squaring the foundation, excavating, types of foundations, form building for concrete, anchoring, placing of sills, joists, bridging, studding, bracing, rafter cutting and fitting.

The laboratory work consists of exercises along the lines given above.

#### MECHANICAL DRAWING

MECHANICAL DRAWING. Drafting-room practice, four hours.

An elementary course in mechanical drawing designed to teach students to read and interpret simple working drawings and to make working drawings of simple objects or designs. Some attention is devoted to the use of the triangles, T-square, and drawing instruments, and to the principles of orthographic projection.

#### ROAD BUILDING, IRRIGATION AND DRAINAGE

1.—SURVEYING. Sophomore year, fall and spring terms. Class work, one hour; field work, four hours. Three credits.

This is a brief course in the care and use of engineers' surveying instruments. The greater part of the time is devoted to exercises and practical problems involving the use of the transit and level.

2.—HIGHWAY ENGINEERING. Spring term. Class work, three hours. Three credits.

The work in the class room is devoted to a study of the theory and practice of economic highway and pavement construction and maintenance, including a study of the needs of traffic, of its effect on the road surface, and of the materials of construction.

3.—IRRIGATION AND DRAINAGE. Fall term. Class work, three hours. Three credits.

In this course a study is made of the application of engineering principles to the design and construction of drainage and irrigation works. Considerable attention is paid to the development of ground water supplies for irrigation. Any senior engineering student may enter the course.

4.—BRIDGE AND CULVERT CONSTRUCTION. Short course in Highways, Irrigation and Drainage. Three recitations; four hours in the drafting room. Five credits.

This is an elementary course in the design and construction of highway bridges and culverts.

5.—SPECIFICATIONS AND CONTRACTS, ROAD LAWS AND ADMINISTRATION. Class work, two hours.

A brief treatment of the road laws and administration in the various parts of the United States and Europe, dealing with specifications for various types of highway construction and the fundamental considerations to be dealt with in the formation of contracts.

6.—ROAD MACHINERY AND MATERIALS LABORATORY. Laboratory practice, four hours.

A study of the use of various road building machines and the testing of various road materials.

### **Mechanic Arts in the Summer School**

The College has been unable to supply from its regular graduates all of the teachers in manual training required by the high schools of the State, and in order to encourage the introduction of manual training and industrial drawing in all grades the College offers summer courses for teachers in manual training, agriculture, and domestic science.

The work in drawing is an elementary course in free-hand and object drawing especially designed to assist teachers in the use of the state text in drawing.

In manual training and shop practice several courses are offered, embracing different grades of work and different materials. One of these is for pupils in the primary grades, and includes weaving, cord work, raffia, reed work and cardboard construction. Other courses deal with woodworking for the grammar grades and for high schools. These include not only a careful study of tools and processes, and practice in important exercises in joinery, but practical cabinet construction, wood turning, wood carving and inlaying, polishing and finishing.

In metal work a course in forging includes practical exercises for high-school work, involving the operations of drawing, upsetting, welding, twisting, splitting and shaping. Sufficient instruction is given in the forging of tool steel to enable one to make and temper many of the tools needed in high-school work. Another course includes bench work and machine-tool work, and familiarizes the student with some of the fundamental operations of a modern machine shop.

A special circular giving further details of this work may be had upon application to the President of the College. See, also, article in this catalogue on the Summer School.

**Engineering Fellowships**

The Board has established two fellowships in engineering. Each fellowship is two years in duration. The holder is expected to devote eleven months of the year to the work laid out, and receives from the College \$500 annually.

To be eligible for appointment, the applicant must be a graduate of a technical course of a school or college of recognized standing. Preference will be given to those who have had some commercial experience along the lines of research to be followed.

Applications for fellowships should be made to the dean of the Division of Mechanic Arts, and should state the lines of work that the applicant particularly desires to follow.

## Division of Home Economics

MARY PIERCE VAN ZILE, *Dean.*

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The philosophy which long ruled our educational policy has been so modified by research in the sciences and by development of the industries, arts, and professions, that it is now recognized that any perfected educational system must include technical training. It must encourage the student's natural desire for productive work—work in which there is a living connection between theory and practice. These broader views have been accepted by college and university men, and the result is noted in the success attained by combining industrial, technical, and scientific work with the general studies. The result is evidenced in the new courses of study for our young men and women. It is safe to assume that there are now but few educators who are so conservative as not to be in sympathy with the collegiate education in home training which is furnished by courses in home economics.

The courses are designed to fit young women to be home makers and capable women in whatever sphere their life work may be. The training is both specific and general. While it emphasizes primarily the practical and material side of life, it does not stop here. The young women are constantly reminded that life is not drudgery; that technical knowledge and scientific skill, even, fail to include the full meaning of education in its highest sense. They are taught that any training that fails to develop harmoniously body, mind, and spirit is inadequate and incomplete. They are brought face to face with ideals as well as with actualities, and are made to see that, while skillful labor gives dignity to life, grace, refinement, and self-poise are the highest requisites for true service.

The training given is as varied as it is broad. It includes a knowledge of the laws of health, an understanding of the sanitary requirements of the home; the study of values, both absolute and relative, of the various articles (including food) that are used in the home; the wise expenditure of money, time, and energy; the scientific principles underlying the selection and preparation of food; the right care of children; and the ability to secure efficient service from others. Instruction is methodical and thorough, and is suited to the circumstances of the students. Experience shows that such training teaches contentment, industry, order, and cleanliness, and fosters a woman's independence and feeling of responsibility.

The work in home economics includes:

A four-year course, leading to degree of bachelor of science.

A three-year course in the School of Agriculture.

A six-months housekeepers' course, for which a certificate of proficiency is granted.

#### COURSE IN HOME ECONOMICS

The popularity of the four-year home economics course is evidenced by the fact that fully eighty-five per cent of the girls who graduate from the College graduate from this course. The training is both general and specific. Since scientific training is fundamental in the intelligent and successful administration of the home, strong courses in the sciences are given as a foundation for the special training in home economics. To the end that well-rounded culture may be attained, courses in English, history, economics, and psychology receive due prominence. The time of the student is about equally divided among the purely technical subjects, the fundamental sciences, and the cultural studies. The courses in the related subjects are given in the different departments of the College, while the technical courses are given by the home economics departments. In the junior and senior years opportunity is given for choice of electives, which makes it possible for the student to specialize in some chosen line. To this end electives are to be chosen in groups combined logically in courses approved by the Faculty or by the student's dean.

The four-year course is recommended for all who desire to teach domestic science or domestic art. It is with difficulty that the home economics training schools meet the demand for well-prepared teachers, a demand which is increasing more rapidly each year. The College does not assume the responsibility of insuring employment to graduates, but the latter rarely experience difficulty in obtaining remunerative positions as instructors in domestic science or in domestic art, as dietitians, or as professional housekeepers.

### Course in Home Economics

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

#### FRESHMAN

FALL	WINTER	SPRING
English I 4 (4-0)	English II 4 (4-0)	College Rhetoric I 4 (4-0)
Chemistry I 4 (3-2)	Chemistry II 4 (2-4)	Chemistry III 4 (3-2)
Household Physics 4 (4-0)	Food Preparation 4 (2-4) or Home Problems 4 (3-2)	Textiles 4 (2-4)
Object Drawing 2 (0-4)	Library Methods 2 (1-2)	Color and Design I 2 (0-4)
Domestic Art I 2 (0-4)	Domestic Art II 2 (0-4)	Domestic Art III 2 (0-4)
Physical Training	Physical Training	Physical Training

#### SOPHOMORE

Qualitative Analysis 4 (2-4)	Elementary Organic Chemistry 4 (4-0)	Human Physiology 4 (4-0)
General Zoölogy I 4 (2-4)	General Zoölogy II 4 (2-4)	Embryology 4 (2-4)
Elementary German I 4 (4-0)	Elementary German II 4 (4-0)	German Readings 4 (4-0)
Costume Design 4 (0-8)	Drafting and Pattern Making 2 (0-4)	Dressmaking 2 (0-4)
	Geometrical Drawing 2 (0-4)	Working Drawings 2 (0-4)
Physical Training or Music	Physical Training or Music	Physical Training or Music

#### JUNIOR

College Rhetoric II 4 (4-0)	English Literature I 4 (4-0)	English Literature II 4 (4-0)
Human Nutrition 4 (4-0)	Food and Nutrition I 6 (3-6)	Food and Nutrition II 4 (2-4)
Household Microbiology I 4 (2-4)	Household Microbiology II 4 (2-4)	Home Sanitation 4 (4-0)
Advanced Dressmaking 2 (0-4)		Home Architecture 2 (0-4)
Elective or Psychology 4 (4-0)	Elective 4 ( - )	Elective 4 ( - )

#### SENIOR

Household Chemistry 4 (1-6)	Household Entomology 2 (2-0)	History of Costume 2 (2-0)
American Government 4 (4-0)	American History I 4 (4-0)	Economics 4 (4-0)
Dietetics 4 (2-4)	Home Nursing 3 (3-0)	Psychology or Elective 4 (4-0)
Kitchen Gardening 2 (2-0)	Therapeutic Cookery 3 (1-4)	Ornamental Gardening 2 (2-0)
	Marketing and Serving 2 (0-4)	Home Decoration 2 (0-4)
Elective 4 ( - )	Elective 4 ( - )	Elective 4 ( - )



**Electives—Course in Home Economics.**

FALL	WINTER	SPRING
Institutional Management 4 (4-0)	Household Administration 4 (4-0)	Bread Making 4 (2-4)
Home Economics Education 5 (3-4)	Care of the Child 4 (4-0)	Fancy Cookery 2 (0-4)
Tailoring 4 (0-8)	Millinery 4 (0-8)	Fine Needlework 4 (0-8)
		Art Needlework 2 (0-4)
Inorganic Chemistry I 5 (3-4)	Inorganic Chemistry II 5 (3-4)	Inorganic Chemistry III 5 (3-4)
Organic Chemistry I 5 (3-4)	Organic Chemistry II 5 (3-4)	Organic Chemistry III 5 (3-4)
Physiological Chemistry I 4 (2-4)	Physiological Chemistry II 4 (2-4)	Physiological Chemistry III 4 (2-4)
German Comedies 4 (4-0)	German Prose I 4 (4-0)	German Prose II or Teachers' German 4 (4-0)
Advanced Zoölogy I 4 (2-4)	Advanced Zoölogy II 4 (2-4)	Advanced Zoölogy III 4 (2-4)
Parasitology 3 (2-2)	Evolution of Domestic Animals 2 (2-0)	General Zoölogy Technique 4 (1-6) or Economic Zoölogy 4 (2-4)
	Home Dairying 2 (2-4) ½ term	
	Home Poultrying 2 (4-0) ½ term	
Study of Oratory 4 (4-0)	The English Drama 4 (4-0) or The English Novel 4 (4-0)	American Literature 4 (4-0) or Nineteenth Century Lit- erature 4 (4-0)
Bible English 4 (4-0)	Farm and Home English 4 (4-0)	Business English 4 (4-0)
Farm Advertising 3 (3-0)	Farm Stories 3 (3-0)	Farm Bulletins 3 (3-0)
		Applications 1 (1-0)
English History 4 (4-0)	French History 4 (4-0)	Modern Europe 4 (4-0) or American History II 4 (4-0)
Sociology 4 (4-0)	Business Organization 2 (2-0)	Money and Banking 2 (2-0)
	Wage Problems 2 (2-0)	Public Finance 2 (2-0)
Educational Psychology 4 (4-0)	History of Education 4 (4-0)	Principles of Education 4 (4-0)
School Administration and School Law 4 (4-0)		

NOTE.—Students intending to teach should elect the educational subjects listed above.

## Domestic Art

Professor BIRDSALL  
Instructor COWLES  
Assistant FEWELL  
Assistant FECHT  
Assistant JONES  
Assistant THOMAS  
Assistant FERREE  
Assistant BUXTON  
Assistant ULRICH

The object of the instruction in domestic art is to give young women a practical knowledge of the selection of materials; the growing of textile fibers, and the processes used in their manufacture into fabrics. The course also offers instruction in hand and machine sewing; principles of drafting and designing patterns; dressmaking, tailoring, millinery, costume design, history of costume and textiles. The student furnishes all her materials.

1.—DOMESTIC ART I. Freshman year, fall term. Laboratory, four hours. Two credits. Required in the course in home economics; elective in the course in general science.

This course includes practice in hand sewing, fundamental stitches being applied to simple articles; patching and darning; use of the sewing machine; making corset cover.

2.—DOMESTIC ART II. Freshman year, winter term. Laboratory, four hours. Two credits. Required in the course in home economics; elective in the course in general science. Prerequisite: Domestic Art I.

This course continues the work of Domestic Art I. The appropriate materials and trimmings for undergarments are discussed; use of sewing machine and attachments; pattern drafting; cutting and making drawers and skirt.

3.—DOMESTIC ART III. Freshman year, spring term. Laboratory, four hours. Two credits. Required in the course in home economics; elective in the course in general science. Prerequisite: Domestic Art II.

This course instructs in a simple system of pattern drafting with the use of tapeline and square; making shirt waist and skirt. Materials used may be of cotton or linen.

4.—TEXTILES. Freshman year, spring term. Class work, two hours; laboratory, four hours. Four credits. Required in the course in home economics. Prerequisite: Chemistry I and II.

This course considers the primitive forms of textile industries and their development; the present method of spinning and weaving; classification; manufacture and finish of all important fibers.

*Laboratory.*—The laboratory work considers the identification of fibers and substitute materials by means of the microscope; chemical tests to determine adulteration and admixtures of cloth; identifying materials, names, prices, widths, variation of weaves; cleaning, laundering and dyeing; weaving rag rug.

5.—COSTUME DESIGN. Sophomore year, fall term. Laboratory, eight hours. Four credits. Required in the course in home economics; elective in the course in general science.

This course includes a study of the principles of design, color harmony, and the application of art in dress; original problems and their direct application to designs for textiles, embroideries, and costumes; sketching of costumes in pencil and water color; costumes for reproduction in materials in direct relation to dressmaking.

6.—DRAFTING AND PATTERN MAKING. Sophomore year, winter term. Laboratory, four hours. Two credits. Required in the course in home economics; elective in the course in general science.

This course gives practice in taking measures, drafting and designing patterns. All foundation patterns are drafted to measure and fitted; designs are draped on the form without patterns, using cheesecloth and other suitable inexpensive materials.

7.—DRESSMAKING. Sophomore year, spring term. Laboratory, four hours. Two credits. Prerequisites: Costume Design; Drafting and Pattern Making.

This course includes practice in adapting patterns in making a cloth dress and a fancy waist.

8.—ADVANCED DRESSMAKING. Junior year, fall term. Laboratory, four hours. Two credits. Required in the course in home economics. Prerequisite: Dressmaking.

This course emphasizes the artistic side of line and decoration in dress; presents the use of commercial patterns; includes practice in cutting, fitting, finishing and the draping of such materials as silks, satins, chiffons, and laces.

9.—HISTORY OF COSTUME. Senior year, spring term. Class work, two hours. Two credits. Required in the course in home economics.

This course includes a survey of ancient Egyptian, Grecian, Roman, early and modern French costumes. Its aim is to give the student information regarding these different periods; comparisons are held regarding the adaptation to present fashions.

10.—ART NEEDLEWORK. Junior year, spring term. Laboratory, four hours. Two credits. Elective in the course in home economics.

This course includes the following: stitches in crochet, knitting, cross-stitch, French embroidery, Roman cut work; their application to undergarments, waists, collars, and household linens.

11.—FINE NEEDLEWORK. Senior year, spring term. Laboratory, eight hours. Four credits. Elective in the course in home economics.

This course is designed to give instruction in needlework applied to hand made garments, which includes a lingerie waist, children's and infants' clothing.

12.—TAILORING. Senior year, fall term. Laboratory, eight hours. Four credits. Elective in the course in home economics. Prerequisite: Domestic Art 8.

This course includes discussions of materials suitable for tailored suits; sponging, cutting, fitting and finishing a coat and skirt.

13.—MILLINERY. Senior year, winter term. Laboratory, eight hours. Four credits. Elective in the course in home economics.

This course includes practical and artistic principles of millinery; preparing various materials for trimmings; practice in making bows, rosettes, and other forms of hat decoration; making wire and buckram frames; use of velvet, silk and straw; renovating, and use of old materials.

## Domestic Science

Professor VAN ZILE  
Associate Professor Dow, in Charge  
Instructor CATON  
Instructor FORD  
Instructor RIGNEY  
Instructor MEADE  
Assistant WILLIAMS  
Assistant GREEN  
Assistant COX  
Assistant SKINNER  
Assistant DAVIS  
Assistant HARKER

Technically, domestic science is an application of the science of bacteriology to the study of home sanitation and hygiene; of physiology and chemistry to the composition of foods and their effect upon the human body; of physics as applied to heating and lighting. Since the home is dependent upon the sciences of chemistry, physiology, and bacteriology, and the application of these to hygiene, direct use of the principles of these sciences is made in the lessons in cookery, dietetics, home nursing, and household management. In the kitchen laboratory a standard system of measurement is taught, and constant emphasis is laid upon neatness, accuracy, and economy in the handling of materials and utensils. Science, applied science, and practice are presented in their proper relations, so that the student who completes these courses gains not only a theoretical knowledge of the principles underlying the profession of home making, but experience in applying them.

1.—FOOD PREPARATION. Freshman year, winter term. Class work, two hours; laboratory, four hours. Four credits. Required in the course in home economics for students who have not had a course in foods in high school. Elective for young women in the courses in general science and industrial journalism.

Foods are classified, according to similarities in their composition, into groups representative of the five food types—carbohydrates, fats, proteins, mineral matter, and water; their sources, composition and digestive value are considered. The conditions under which food materials are matured and marketed, and the problems which relate to their storage and transportation are also considered.

*Laboratory.*—Principles underlying the cookery of food are illustrated in the preparation of representative foods.

2.—HOME PROBLEMS. Freshman year, winter term. Class work, three hours; laboratory, five hours. Four credits. Required in the course in home economics, as a substitute for Food Preparation, for students who have studied foods in high school; elective for students in the courses in general science and industrial journalism.

This course includes a study of the history of the development of woman's place and work in the home and of the training for that work that is being given in educational institutions. Special problems of a week's work in the home are studied.

*Laboratory.*—Principles underlying methods of doing the work of the household are illustrated by demonstration and experimental work with foods, cleaning agents, etc.

3.—FOOD AND NUTRITION I. Junior year, winter or spring term. Class work, three hours; laboratory, six hours. Six credits. Required in the course in home economics; elective for young women in the courses in

general science and industrial journalism. Prerequisite: Human Nutrition; Microbiology I.

This course comprises a study of food and its relation to the body, to the composition of the body, and to the daily income of nutrients required and the output of waste. Carbohydrates are considered as to their classification, composition, occurrence, and general properties, which matters are followed by a study of typical carbohydrate foods. Fats and proteins are studied in the same manner. Food values and costs are emphasized throughout the course. Lectures are given and reference work is required.

*Laboratory.*—Experimental cookery. This is an experimental study of carbohydrates, fats, and proteins, the knowledge thus gained being then applied to the preparation of foods.

4.—FOOD AND NUTRITION II. Junior year, spring term. Class work, two hours; laboratory, four hours. Four credits. Required in the course in home economics; elective for young women in the courses in general science and industrial journalism. Prerequisite: Food and Nutrition I.

This course is a continuation of the course in Food and Nutrition I. Leavening agents, flour mixtures, fruit and vegetable preservation are the subjects studied.

*Laboratory.*—Experimental cookery continued, studying the problems connected with the use of the various leavening agents and the preservation of fruits and vegetables.

5.—DIETETICS. Senior year, fall term. Class work, two hours; laboratory four hours. Four credits. Required in the course in home economics. Prerequisite: Food and Nutrition I and II.

This course is an application of principles of human nutrition, as applied to the feeding of individuals, underlying physiological, economic, and social conditions, and a study of dietary standards. Lectures are given and reference work is required.

*Laboratory.*—A practical comparison is made of the nutritive values of the common foods by computing, preparing and serving dietaries of specific costs in which specified nutrients are furnished.

6.—THERAPEUTIC COOKERY. Senior year, winter term. Class work, one hour; laboratory, four hours. Three credits. Required in the course in home economics. Prerequisite: Dietetics.

This course comprises a study of diet in relation to disease.

*Laboratory.*—Practice in the preparation and serving of food suitable for the sick.

7.—MARKETING AND SERVING. Senior year, winter term. Laboratory, four hours. Two credits. Required in the course in home economics; elective for young women in the courses in general science and industrial journalism. Prerequisite: Dietetics.

This course gives an opportunity for practice in home cookery. It includes the planning, preparation and serving of meals based upon dietetic and economic standards.

8.—HOME SANITATION. Junior year, spring term. Class work, four hours. Four credits. Required in the course in home economics.

This course includes a study of the conditions which determine the healthfulness of the house, and the application of principles of sanitation to its care. Sanitary construction, ventilation, heating, lighting and plumbing of the house are considered. Lectures are given and reference work is required. Prerequisite: Working Drawings.

9.—INSTITUTIONAL MANAGEMENT. Senior year, spring term. Class work, four hours. Four credits. Elective in the courses in home economics, general science and industrial journalism.

This course includes the study of the various types of institutions, their aim, support, control, needs, equipment and methods of purchasing supplies, together with the study of the essential characteristics, preparation and duties of the manager. Lectures are given followed by discussions. Reference and observation work required.

10.—HOUSEHOLD ADMINISTRATION. Senior year, winter term. Class work, four hours. Four credits. Elective in the course in home economics.

The purpose is to secure an intelligent judgment regarding the general management of the home. The place of the home and the homemaker in the economic world, the organization of the household, the value and cost of house furnishings and their care, the apportionment and judicious expenditure of the income, the method of keeping accounts, and the general cost of living, are the subjects studied. Lectures are given and reference work is required.

11.—BREAD MAKING. Senior year, spring term. Class work, two hours; laboratory, four hours. Four credits. Elective in the course in home economics. Prerequisite: Food and Nutrition I.

This course includes a microscopic study of yeasts, a careful consideration of milling methods, visits to mills, and an investigation of all the conditions that may affect the quality of bread. Many methods are followed in the preparation of bread, and comparisons are made of the various methods.

12.—CARE OF THE CHILD. Senior year, spring term. Class work, four hours. Four credits. Elective in the course in home economics. Prerequisites: Physiology and Psychology.

A study of the rational care of the child from infancy to adolescence. It includes the daily routine of the infant, bath, food, clothing, and rest, and the factors that influence habit formation and mental development.

13.—FANCY COOKERY. Senior year, spring term. Laboratory, four hours. Two credits. Elective in course in home economics. Prerequisites: Food and Nutrition I and II.

This course applies the principles taught in Food and Nutrition I and II to fancy dishes which give practice and to further develop skill in manipulation.

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## Home Economics Education

Associate Professor DOW  
Assistant JONES

1.—HOME ECONOMICS EDUCATION. Senior year, fall term. Class work, three hours; laboratory, four hours. Five credits. Elective in the course in home economics. Prerequisites: Food and Nutrition I and II.

This is a study of methods of preparation on the part of the teachers for the class exercises, the mode of conducting it, the making of lesson and course outlines, and the arrangement and equipment of laboratories, together with the cost of equipment and supplies.

*Laboratory.*—The laboratory work consists of observation, demonstration, and practice teaching.

## Housekeepers' Course in Home Economics

There are large numbers of young women who, from lack of time, are unable to take an extended course, but who recognize the need for special training in home making. The twentieth century demands of home managers an understanding of the sanitary requirements of the home, a knowledge of values, absolute and relative, of the articles used in the house, quick attention to details, good judgment in buying and a ready adaptation of means to the end in view. The purpose of the housekeepers' course is to furnish this training. The teaching in this course is no less accurate than in the regular course, but is necessarily different. Given to students without scientific training, the instruction must be more largely a presentation of facts, without an elaboration of the underlying principles. The work is intensely practical, and the hundreds of young women who take this course go back to their homes with a broader view of life, and a knowledge and training that will enable them to meet their responsibilities.

### REQUIREMENTS FOR ADMISSION

Young women between the ages of eighteen and twenty-one are admitted upon presentation of common-school diploma, grammar-school certificate, or high-school diploma, or upon passing an examination in the following subjects: reading, writing, spelling, arithmetic, grammar, geography, physiology, and United States history. Young women over twenty-one are admitted without examination.

### HOUSEKEEPERS' COURSE

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

FALL	WINTER
Cookery I 4½ (0-9)	Cookery II 6 (0-12)
Sewing 4½ (0-9)	Home Nursing 2 (2-0)
Color and Design 3 (0-6)	Dressmaking 4 (0-8)
Hygiene 1 (1-0)	Floriculture 2 (2-0)

NOTE.—Young women registered in the Housekeepers' Course may during the fall term select one additional subject selected from the college courses or from the courses in the School of Agriculture. Before being assigned to such subject the student must present satisfactory evidence that she is qualified to carry such work successfully.

### SUBJECTS TAUGHT IN HOUSEKEEPERS' COURSE

COOKERY I. Fall term, nine hours.

A laboratory course. Stoves, stove construction, stove management, and fuels are the first topics considered, and are followed by experiments illustrating the effect of heat upon starch and proteids. The necessary elementary principles involved are then applied to the cooking of cereals, vegetables, beverages, breads, meats, soups, and simple cake mixtures and puddings.

SEWING. Fall term. Laboratory, nine hours.

This course covers a full course in hand sewing; practice in the fundamental stitches being applied to simple articles, consisting of a bag, towel, patching, and darning, etc. The appropriate materials and trimmings for undergarments are discussed; sewing machine problems and their attachments; pattern drafting; cutting and making corset cover, drawers, underskirt, and shirt-waist suit.

Materials used may be of cotton or linen. The student furnishes all her materials.

COLOR AND DESIGN. Fall term, six hours.

A laboratory course in simple designing and in studying color relations, with special reference to problems in the home.

COOKERY II. Winter term, twelve hours.

A laboratory course. The work of the term is divided into three parts. Four weeks are given to the planning and serving of meals; four weeks to the study of diet in relation to disease, with the preparation of suitable food; and four weeks to canning, preserving, and the making of salads, cakes, pastries, and desserts.

HOME NURSING. Winter term, two hours.

This course includes the study of the sick room and its care and furnishing, and the duties of the home nurse in giving intelligent assistance to the physician, and in contributing to the comfort of the sick. This involves also the ability to recognize and report symptoms correctly; to relieve pain; to give baths; to change bedding; to disinfect; and to treat wounds, burns, and sprains, as well as to meet successfully other emergencies that may arise in the home.

DRESSMAKING. Winter term. Laboratory, eight hours.

This course includes practice in the following: Adaptation of patterns, cutting, fitting, and making a cloth dress and fancy waist. The student furnishes all her materials.

FLORICULTURE. Winter term. Class work, two hours.

Lectures in the classroom are supplemented by practical exercises in the greenhouse, dealing with the propagation and culture of flowers. Soil requirements, the planting of seeds, transplanting, cultivation, the making of cuttings, the selection of varieties adapted to the purposes of window gardening, lawn planting and cutting, are discussed in the lectures. An opportunity to become acquainted with the species recommended, and with the operations necessary for their successful culture, is afforded in the laboratory practice.

HYGIENE. Fall term. One hour.

This is a lecture course covering the subjects that have a direct bearing upon the health of a young woman student.

### HOME ECONOMICS IN THE SUMMER SCHOOL

In addition to instruction in various branches of home economics available to many teachers in the spring term, the College offers several courses in this subject during the summer session. Instruction in these courses is intended to represent correctly that which may be introduced successfully into graded schools and high schools. Students will be enrolled upon presentation of a teacher's certificate, or of a certified statement showing that two years' high-school work or its equivalent has been completed.



The general subject of the presentation of home economics is one of the courses offered. Here attention is given to the application of the general principles of teaching to the teaching of domestic science and domestic art, to the planning of lesson and course outlines, and to the equipment of laboratories for grade schools and high schools.

In the courses in domestic science the preparation of food is discussed in its different phases, and the principles studied in the classroom are amply illustrated in the laboratory demonstrations.

In the courses in domestic art, the theory of hand and machine sewing, making shirt-waist suits, and drafting and designing are taught and given ample laboratory demonstration.

A special circular giving in detail the courses offered in the Summer School may be had by applying to the President of the College. See, also, the article on Summer School in this catalogue.

## Division of General Science

JULIUS TERRASS WILLARD, *Dean.*

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In the class of colleges to which this institution belongs, the classical studies of the older type of college are replaced by work in the sciences and in vocational subjects. A sound basis for technical training includes thorough training in mathematics, physical science, and biological science. It is believed also that education should include some preparation for the discharge of one's duties to the State and to the community in which he lives. It should afford him that discipline and culture which alone can give him a grasp of the relations among things, a breadth of view, a tolerant attitude, and hence an influence over his associates and fellow citizens of every station in life.

It is the province of the departments grouped in this division of the College to give this basal scientific, cultural, and disciplinary training. Their work is not only foundational, but it penetrates through all the characteristic vocational courses of the institution, as the structural steel of the modern skyscraper penetrates the entire building and forms a secure framework and support for the parts more readily visible. These departments thus give unity to all of the four-year courses of study, although presenting but two courses that are distinctive of their own work. These, however, by means of electives and options, are susceptible of manifold modification and application.

### THE COURSE IN GENERAL SCIENCE

The course in general science is the lineal descendent of the single course formerly offered here. It includes the fundamental training in English, mathematics, science, history, economics, military drill, and physical culture required in the several specialized vocational courses now offered by the College and chosen by the great body of our students. Its required subjects constitute the central educational basis of the institution. By means of a number of groups of electives, it gives an opportunity to students to advance themselves still further in these fundamental lines and to give special attention to some instead of taking the vocational subjects characterizing other courses. This opportunity meets the needs of several types of young people, among whom are: (1) Those who have not yet fully decided as to their vocation, but who wish an education that is strong and well balanced in respect

to modern science and cultural subjects, as a foundation for further education or as a preparation for sound citizenship and intellectual satisfaction in life. (2) Those who are looking forward to teaching in the high schools of the State. The electives offered allow one to give special attention to mathematics, physical science, biological science, elementary agriculture, elementary domestic science and art, history, economics, English, and professional educational subjects. (3) Those who are fitting themselves for research work in the sciences, especially as applied to agriculture, engineering, and other industries.

The elective groups offered in this course are to a considerable extent made up of studies required in one or more of the specialized courses. They provide also, however, advanced work not included in other courses. The scientific work in connection with the Agricultural and Engineering Experiment Stations, and several fields of State investigation and service, calls for the operation of unusually well-equipped departments in the sciences, and excellent facilities for practical training in this work are thus afforded.

While the course in general science offers a wide choice of electives, these may not be selected aimlessly, or with the idea of choosing the easiest, or of obtaining credit for miscellaneous subjects taken elsewhere or in other courses. The studies of the freshman and sophomore years are basal and are required of all, without exception. They insure a broad and adequate foundation for subsequent work in the several lines of electives. The electives are to be chosen in groups, combined logically in courses approved by the Faculty or by the dean of the Division of General Science. Students changing from other courses to the course in general science receive credit for work done in the other courses in so far as it may be fitted into the general plan of this one.

The course in general science in the junior and senior years requires of all students civics, American history, economics, psychology, and philosophy. This gives opportunity for the election of twenty-two or more additional studies. Not fewer than ninety credit units are to be chosen in groups, in such a manner as to give logical coherence to the course as a whole. The elective portion of the course, as thus made up, will consist for the most part of several groups of three or more full studies or their equivalent. It is possible to include some single subjects that may be advantageously taken without others. For a few courses special combinations in sewing, cooking, and shop work have been planned to meet the needs of prospective teachers of manual training.

The course in general science is thus many in one. Such various combinations of groups are possible that it is not practicable to print all of them in extended form. There are,

therefore, formally presented herewith the required subjects of the course in their specified order by years and terms, together with a considerable number of groups of electives.

Finally, combinations of these groups that have been approved are indicated by means of numbers assigned to the several groups. Other combinations may be arranged.

### THE COURSE IN INDUSTRIAL JOURNALISM

Knowledge is power only as it comes into the possession of those who can use it; it gives pleasure in direct proportion to the extent of its diffusion. A discovery is of but little value as long as the discoverer is the only one who knows of its existence, and the printed page is by far the most effective means of extending knowledge concerning it. Magazines and newspapers never sleep, nor do they take vacations, and their power to elevate mankind is incalculable. But printed knowledge becomes effective only as it is read, and to be read in this day it must stand out from the great mass of other matter, and gain the attention and hold the interest of the reader. To do this, its points must be sharp and easily seen, and the style must be attractive. On the other hand, if the presentation is not essentially true, the more attractive it is the worse it is, and the greater the harm that follows wide reading of it.

The purpose of the course in industrial journalism is to equip men and women with fundamental knowledge, that they may both recognize that which is new, and distinguish truth from falsehood; to enable them to set a proper valuation upon facts as related to the industrial world, that the emphasis of their writings may be properly placed; and to write clear, accurate, forceful, entertaining English.

A writer might advantageously know everything; this being impossible and the field being so broad, this course as offered by the College includes, in the first place, studies that are basic to all industrial life and its presentation—English, history, economics, physics, chemistry, the biological sciences, etc., and two years in the theory and practice of effective writing and publication. In the second place, this course gives opportunity for choice of elective groups of subjects directed towards agriculture, mechanic arts, home economics, or general science. Thus, a student may elect subjects that will give special knowledge concerning farm crops, live stock, horticulture, forestry, mechanic arts, home economics, etc.

The College thus affords preparation for work in a wide and inviting field. Our unprecedented industrial achievements have been made by the application of discoveries in physical and biological science. Much of discovery, and much of application, is yet to come, and one who can write truthfully and attractively of that which is, and of that which comes, will find ample reward.

## Course in General Science

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

## FRESHMAN

FALL	WINTER	SPRING
English I 4 (4-0)	English II 4 (4-0)	College Rhetoric I 4 (4-0)
Chemistry I 4 (3-2)	Chemistry II 4 (2-4)	Chemistry III 4 (3-2)
Plane Trigonometry 4 (4-0)	College Algebra 4 (4-0)	Public Speaking 4 (4-0)
General Zoölogy I 4 (2-4)	General Zoölogy II 4 (2-4)	Embryology 4 (2-4)
Library Methods 2 (1-2)	Object Drawing 2 (0-4)	Geometrical Drawing 2 (0-4)
Military Drill* or Physical Training†	Military Drill* or Physical Training†	Military Drill* or Physical Training†

## SOPHOMORE

College Rhetoric II 4 (4-0)	English Literature I, or English Literature‡ 4 (4-0)	English Literature II, or Analytical Geometry‡ 4 (4-0)
General Physics I 4 (3-2)	General Physics II 4 (3-2)	General Physics III 4 (3-2)
Qualitative Analysis 4 (2-4)	El. Organic Chemistry 4 (4-0)	Advanced English History 4 (4-0)
General Botany 5 (3-4)	Plant Anatomy 5 (3-4)	Plant Physiology 4 (2-4)
		Elective 2 ( - )
Military Drill* or Physical Training†	Military Drill* or Physical Training†	Military Drill* or Physical Training†

## JUNIOR

Psychology 4 (4-0)	Economics 4 (4-0)	American Government 4 (4-0)
Electives§ 14 ( - )	Electives§ 14 ( - )	Electives§ 14 ( - )

## SENIOR

American History I 4 (4-0)	Philosophy 4 (4-0)	
Electives 14 ( - )	Electives 14 ( - )	Electives 18 ( - )

\* For young men.

† For young women.

‡ If the student is planning to elect the biological groups for the junior and senior years, English Literature and Analytical Geometry must be chosen at this point instead of English Literature I and English Literature II.

§ Electives are to be chosen by groups, and in combinations approved by the Faculty or the dean of the Division of General Science.

**Elective Groups—Course in General Science**

FALL	WINTER	SPRING
1		
Elementary German I 4 (4-0)	Elementary German II 4 (4-0)	German Readings 4 (4-0)
2		
German Comedies 4 (4-0)	German Prose I 4 (4-0)	German Prose II 4 (4-0)
3		
Calculus I 4 (4-0)	Calculus II 4 (4-0)	Calculus III 4 (4-0)
4		
Radiant Energy 4 (3-2)	Physical Measurements 4 (2-4)	Physical Manipulations 4 (2-4)
5		
Inorganic Chemistry I 5 (3-4)	Inorganic Chemistry II 5 (3-4)	Inorganic Chemistry III 5 (3-4)
6		
Organic Chemistry I 5 (3-4)	Organic Chemistry II 5 (3-4)	Organic Chemistry III 5 (3-4)
7		
Physiological Chemistry I 4 (2-4)	Physiological Chemistry II 4 (2-4)	Physiological Chemistry III 4 (2-4)
8		
Advanced Zoölogy I 4 (2-4) or General Bacteriology 4 (2-4)	Advanced Zoölogy II 4 (2-4)	Advanced Zoölogy III 4 (2-4)
9		
Plant Pathology I 4 (2-4)	Plant Pathology II 4 (2-4)	Taxonomic Botany 4 (1-6)
10		
Economic Botany 4 (2-4)	Evolution of Plants 4 (4-0)	Plant Breeding or Plant Physiology III 4 (2-4) Mathematics of Biology 4 (4-0)
11		
General Entomology 4 (3-2)	Taxonomy of Insects 4 (0-8)	Gen. Economic Entomology 4 (3-2)
12		
Plant Pathology I 4 (2-4)	Parasitology 3 (2-2)	Economic Zoölogy 4 (2-4) Mathematics of Biology 4 (4-0)
13		
Plant Pathology I 4 (2-4)	Dairy Bacteriology 4 (2-4)	Hygienic Bacteriology 4 (2-4)

ELECTIVE GROUPS—COURSE IN GENERAL SCIENCE—*continued.*

FALL	WINTER	SPRING
14		
Soil Microbiology 4 (2-4)	Serum Therapy 4 (3-2)	Water Purification and Sew- age Disposal 4 (1-6) Mathematics of Biology 4 (4-0)
15		
General Bacteriology 4 (2-4)	Household Microbiology II 4 (2-4)	Human Physiology 4 (4-0)
16		
	Food Preparation 4 (2-4)	
Human Nutrition 4 (4-0)	Food and Nutrition I 6 (3-6)	Food and Nutrition II 4 (2-4)
17		
Domestic Art I 2 (0-4)	Domestic Art II 2 (0-4)	Domestic Art III 2 (0-4)
Costume Design 4 (0-8)	Drafting and Pattern Making 2 (0-4)	Dressmaking 2 (0-4)
Color and Design I 2 (0-4)		Working Drawings 2 (0-4)
18		
History of Education 5 (5-0)	Rural Education 4 (4-0)	School Administration 4 (4-0)
School Hygiene 2 (2-0)	Agricultural Education or Home Econ. Education or Industrial Education 2 (2-0)	Educational Psychology 4 (4-0)
19		
Cereal Crop Production 5 (3-4)	Forage Crops 4 (3-2)	Elements of Dairying 4 (2-4)
Market Types and Classes of Stock 4 (1-6)	Breeding Types and Classes of Stock 4 (1-6)	Farm Mechanics 4 (2-4)
20		
Farm Poultry Production 3 (2-2)	Farm Forestry 4 (3-2)	Plant Propagation 4 (3-2)
Forage Crop Improvement 4 (1-6)	Soils 5 (3-4)	Landscape Gardening 3 (2-2)
21		
Woodwork I 4 (1-6)	Woodwork IV G 3 (1-4)	Blacksmithing I 3 (1-4)
Woodwork III G 6 (2-8)	Wood Turning G 3 (1-4)	Foundry 3 (1-4)
		Pattern Making 3 (1-4)
22		
Engineering Physics I 5 (3-4)	Engineering Physics II 5 (3-4)	Engineering Physics III 6 (4-4)
Blacksmithing II 3 (1-4)	Blacksmithing III G 3 (1-4)	Blacksmithing IV G 2 (1-2)
Machine Shop I 3 (1-4)	Machine Shop II 3 (1-4)	Machine Shop III G 3 (1-4)
Clay Modeling 3 (0-6)		Kinematics I 4 (4-0)

ELECTIVE GROUPS—COURSE IN GENERAL SCIENCE—*continued.*

FALL	WINTER	SPRING
23		
Rhetoric of Oratory 4 (4-0)	American Literature or 19th Century Literature 4 (4-0)	The English Drama or The English Novel 4 (4-0)
24		
History of Economic Thought 4 (4-0)	Business Organization 2 (2-0) Labor Problems 2 (2-0)	Money and Banking 2 (2-0) Public Finance 2 (2-0)
25		
Theory of Music History of Music Harmony	One hour of each a week throughout the year, with instrumental or vocal music daily. 12 credit units.	
26		
Harmony, continued through the year, with instrumental or vocal lessons and daily practice. 12 credit units.		
27		
French History 4 (4-0)	Modern Europe 4 (4-0) or Business Law 2 (2-0) and International Law 2 (2-0)	American History II 4 (4-0) or Kansas History 2 (2-0) and Farm Law 2 (2-0)
28		
Sociology 4 (4-0)	Business Law 2 (2-0) International Law 2 (2-0)	American Literature 4 (4-0)
29		
General Entomology 4 (3-2)	General Bacteriology 4 (2-4)	Human Physiology 4 (4-0)
30		
Elementary Journalism 2 (2-0) Journalism Practice I 2 (0-4)	Farm Writing 2 (2-0) Journalism Practice II 2 (0-4)	Gathering News 2 (2-0) Journalism Practice III 2 (0-4)
31		
Copy Reading 2 (2-0) Journalism Practice IV 2 (0-4)	Newspaper Law 2 (2-0) Journalism Practice V 2 (0-4)	Editorial Practice 2 (2-0) Journalism Practice VI 2 (0-4)
32		
Ink Rendering 2 (0-4)	Color Rendering 2 (0-4)	Linear Perspective 2 (0-4)
33		
General Bacteriology 4 (4-0) Histology III 4 (2-4) Pathology I 7 (5-4) Anatomy I 6½ (1-11)	Histology I 7 (5-4) Comp. Physiology I 4 (2-4) Pathology II 7 (4-6)	Histology II 4 (2-4) Comp. Physiology II 7 (5-4) Pathology III 7 (4-6)



ELECTIVE GROUPS—COURSE IN GENERAL SCIENCE—*continued.*

FALL	WINTER	SPRING
34		
Sociology 4 (4-0)	Rural Sociology 4 (4-0)	Community Surveys 2 (2-0)
35		
Argumentation and Debate 4 (4-0)	English Practice 4 (4-0)	Applied English 4 (4-0)
36		
Bible English 4 (4-0)	Farm and Home English 4 (4-0)	Business English 4 (4-0)
37		
Farm Advertising 3 (3-0)	Farm Stories 3 (3-0)	Farm Bulletins 3 (3-0)
38		
Industrial Chemistry I 6 (3-6)	Industrial Chemistry II 6 (3-6)	Industrial Chemistry III 6 (3-6)
39		
Analytical Geometry 4 (4-0)	Calculus 4 (4-0)	Teachers' Course in Mathematics 4 (4-0)

The following subjects and others may be elected independently of other members of groups if prerequisites have been taken:

General Entomology 4 (3-2)	Technique of Speech 2 (2-0)	Human Physiology 4 (4-0)
General Bacteriology 4 (2-4)	General Bacteriology 4 (2-4)	General Geology 4 (4-0)
Sociology 4 (4-0)	Ethics 4 (4-0)	American Literature 4 (4-0)
Industrial Education 2 (2-0)	School Administration 4 (4-0)	Forms of Public Address 4 (4-0)
Modern Europe 4 (4-0)	Rural Sociology 4 (4-0)	American History II 4 (4-0)
Photography 3 (2-2)	Rural Education 4 (4-0)	German Classics 4 (4-0)
		Applications 1 (1-0)

The following illustrative combinations have been arranged:

Physics and Mathematics—1, 3, 4, 5, 28, and 29.  
 Chemistry, Physics, and Mathematics—1, 2, 3, 4, 5, 6, and Analytical Geometry.  
 Chemistry and Mathematics—1, 2, 3, 5, 6, and 7.  
 Chemistry and Domestic Science—1, 2, 5, 6, 7, 15, and 16.  
 Biological Science, major work in Botany—1, 2, 7, 8, 9, and 10.  
 Biological Science, major work in Zoölogy—1, 2, 7, 8, 11, and 12.  
 Biological Science, major work in Bacteriology—1, 2, 7, 8, 13, and 14.  
 Education and Domestic Science and Art—1, 2, 15, 16, 17, and 18.  
 Education and Agriculture—1, 2, 18, 19, and 20.  
 Education and Manual Training—3, 18, 21, and 22.  
 Education and Humanities—18, 23, 24, and 27 and two groups Mathematics or Science.  
 History and English—1, 2, 23, and 27 and two groups Mathematics or Science.  
 History and Economics—1, 2, 24, and 27 and two groups Mathematics or Science.  
 Economics and English—1, 2, 23, 24, and two groups Mathematics or Science.  
 English and Music—1, 23, 25, 26, and two groups Mathematics or Science.

Students expecting to teach should take group 18.

### Course in Industrial Journalism

The Arabic numeral immediately following the name of a subject indicates the number of credits, while the numerals in parentheses indicate the number of hours a week of recitation and of laboratory, respectively.

FRESHMAN		
FALL	WINTER	SPRING
English I 4 (4-0)	English II 4 (4-0)	College Rhetoric I 4 (4-0)
Chemistry I 4 (3-2)	Chemistry II 4 (2-4)	Chemistry III 4 (3-2)
Library Methods 2 (1-2)	Public Speaking 4 (4-0)	Advanced English History 4 (4-0)
Composition I-J 2 (0-4)	Composition II-J 2 (0-4)	
Object Drawing 2 (0-4)		Geometrical Drawing 2 (0-4)
Electives 4 ( - )	Electives 4 ( - )	Electives 4 ( - )
Military Drill,* or Physical Training†	Military Drill,* or Physical Training†	Military Drill,* or Physical Training†
SOPHOMORE		
College Rhetoric II 4 (4-0)	English Literature I 4 (4-0)	English Literature II 4 (4-0)
General Zoölogy I 4 (2-4)	General Zoölogy II 4 (2-4)	General Bacteriology 4 (2-4)
	Modern Europe 4 (4-0)	Economics 4 (4-0)
Electives 8 ( - )	Electives 6 ( - )	Electives 6 ( - )
Military Drill,* or Physical Training†	Military Drill,* or Physical Training†	Military Drill,* or Physical Training†
JUNIOR		
Elementary Journalism 2 (2-0)	Farm Writing 2 (2-0)	Gathering News 2 (2-0)
Journalism Practice I 2 (0-4)	Journalism Practice II 2 (0-4)	Journalism Practice III 2 (0-4)
American Government 4 (4-0)	American History I 4 (4-0)	American History II 4 (4-0)
Electives 10 ( - )	Electives 10 ( - )	Electives 10 ( - )
SENIOR		
Copy Reading 2 (2-0)	Newspaper Law 2 (2-0)	Editorial Practice 2 (2-0)
Journalism Practice IV 2 (0-4)	Journalism Practice V 2 (0-4)	Journalism Practice VI 2 (0-4)
Principles of Sociology 4 (4-0)	Business Organization 2 (2-0)	
Electives 10 ( - )	Electives 12 ( - )	Electives 14 ( - )

The electives of this course are to be chosen in groups adapted to imparting added proficiency in selected lines of journalistic activity, especially those of agriculture, home economics, mechanic arts and applied science. Some of the possibilities are included in the list of elective groups available for students in the course in general science; others may be arranged by conference with the dean of the division.

\* For young men.

† For young women.

## Bacteriology

Professor BUSHNELL  
Instructor HUNTER  
Instructor JACKLEY  
Assistant GLASGOW

The Department of Bacteriology occupies a part of the first and second floors of Veterinary Hall. The space is divided into offices and private laboratories, an experiment station and research laboratory, two large general laboratories, incubator or temperature room, wash room, and stock room. The laboratories are well lighted and equipped with gas, lockers, ice chests, sterilizers, wall cases, microscopes, and other modern facilities necessary for bacteriological work.

The instruction consists of lectures, recitations, demonstrations, and laboratory practice. Printed synopses of the lectures, and printed laboratory directions, are furnished the students in some of the courses; in others, textbooks are required. The departmental library contains textbooks on bacteriology and allied subjects, also the current files of the important technical periodicals relating to bacteriology. These are at the constant disposal of the students for reference. To those who desire graduate work, the department offers excellent facilities.

Bacteriology is presented to the student as a biological science, and as a practical factor in every-day life. In this subject only the simplest forms of life, consisting almost invariably of one-celled organisms, are studied. At the present time it is possible to study these microscopical forms with ease and accuracy, thus paving the way for a more complete study and a better understanding of cells in the aggregate. The second point of view from which this subject is approached is that of its practical application in agriculture, medicine, domestic science, and sanitary engineering.

### COURSES IN BACTERIOLOGY

1.—GENERAL BACTERIOLOGY. Sophomore or junior year, fall, winter, and spring terms. Lectures, two hours; laboratory, four hours. Four credits. Required in the courses in agriculture and industrial journalism; elective in the course in general science. Prerequisite: Elementary Organic Chemistry.

This general introductory course consists of lectures, recitations, and demonstrations, covering the morphological and biological characters, the classification and the distribution of bacteria; factors necessary for the development of bacteria; culture media, cultural features, staining values, and fundamental principles of applied bacteriology.

*Laboratory.*—The student prepares culture media, and becomes familiar with principles of sterilization and incubation, and with general laboratory technique. During the last half of the term, organisms representing the different families and genera of Migula's classification are studied microscopically and culturally. Also, preliminary quantitative and qualitative examinations are made of milk, water, soil, etc.

2.—PATHOGENIC BACTERIOLOGY. I, sophomore year, winter term; II, junior year, winter term. Lectures, two hours; laboratory, four hours. Four credits each term. Required in the course in veterinary medicine. Prerequisite: Elementary Organic Chemistry.

A study is made of the morphology, powers of resistance, pathogenesis, distribution, channels of infection and means of dissemination of pathogenic bacteria, especially those related to the specific infectious diseases of animals; variations in the nature of infectious diseases; antitoxins, vaccines, and specific treatments; epizootic and epidemic diseases of unknown etiology are further treated.

*Laboratory.*—A study is made of the microscopical and cultural character of pathogenic microorganisms; of laboratory animal inoculations, autopsy, and diagnosis; of the preparation of tuberculin, mallein, and other biological products used in the diagnosis, prevention and treatment of specific infectious diseases. Printed laboratory directions are furnished.

3.—SANITARY BIOLOGY I AND II. Sophomore year, spring term; junior year, fall term. Lecture, one hour; laboratory, four hours. Three credits each term. Required in the course in civil engineering. Prerequisite: Chemistry III.

Consideration is given to morphology, classification, distribution and life processes of bacteria. Attention is given, also, to general characters of algae, fungi and protozoa in their relation to potable water; to the interpretation of the results of quantitative and qualitative bacteriological examinations of water; to the significance of the presence of various bacterial species in drinking water; to water-borne diseases and microorganisms involved; to typhoid-fever epidemics; to the bacteriology of sewage and sewage effluents, and to methods of water purification and sewage disposal.

*Laboratory.*—During the first term of this course the student acquires a working knowledge of bacteriological technique. The second term is utilized in conducting quantitative and qualitative examinations of water and sewage from different sources, according to the standard methods. The course includes a comparative study of presumptive tests for the detection of the presence of *B. coli communis* in water. Printed laboratory directions are furnished.

4.—HOUSEHOLD MICROBIOLOGY I AND II. Junior year, fall and winter terms, respectively. Class work, two hours; laboratory, four hours. Four credits each term. Required in the course in home economics. Elective in the course in general science. Prerequisite: Elementary Organic Chemistry.

This course is designed to give the student a more thorough knowledge of those microorganisms of importance in the household. The significance of microbial findings in the analysis of water, milk, and foods, also, consideration of the conditions which tend to increase or decrease the bacterial content of food substances, are studied in detail. Some time is given to the principles of sanitation as applied to public health problems. The class work is a more theoretical consideration of the problems undertaken in the laboratory.

*Laboratory.*—A study of microorganisms and their activities, both beneficial and harmful, in their relation to household economy, bacteriological study of water, milk, and foods; the determination of the potability of water; milk contamination, the effect of cooling upon the bacterial content of milk, pasteurization of milk, etc.; microscopical study of yeasts and molds; the spoilage of canned vegetables and fruits, methods of food preservation; the manufacture of vinegar; study of activities of various species of microorganisms, thermal death point, the germicidal action of various disinfectants, etc., are taken up in the laboratory work. Printed laboratory directions are furnished.

5.—SERUM THERAPY. Junior year, spring term. Lectures, three hours; laboratory, two hours. Four credits. Required in the course in veterinary science; elective in the course in general science. Prerequisites: Pathogenic Bacteriology I, and either Pathogenic Bacteriology II or Hygienic Bacteriology.

A detailed study is made of the manufacture, standardization, preparation for the market, and use of vaccines, antitoxins, and other biological products related to the diagnosis, prevention and treatment of specific infectious diseases; of susceptibility, immunity, and infection; of theories of immunity; of anaphylaxis, opsonins, precipitins, bacteriolysins, and agglutinins.

*Laboratory.*—Experimental production of opsonins, antitoxins, agglutinins, precipitins, and cytolyticins; experiments showing the constitution and mode of action of these antibodies; production of active and passive anaphylaxis, and of anaphylatoxin; methods for the production and standardization of biological products, such as diphtheria and tetanus antitoxin, bacterins, etc.; the application of the various phenomena of immunity in the diagnosis of infectious diseases; the identification of animal and vegetable proteins; complement fixation tests for glanders, Wassermann tests, opsonic technique, etc., comprise the laboratory work.

6.—SOIL MICROBIOLOGY. Elective, fall term. Lecture, two hours; laboratory, four hours. Four credits. Elective in the courses in agriculture and general science. Prerequisite: General Bacteriology.

This is an introductory course covering the principles of soil microbiology as defined at the present time, and fitting the student for independent research on microbial investigations of soil, including the influence on microbial flora of depth and character of soil, temperature, moisture, chemical reaction, aëration, and other factors; activities of soil microorganisms, ammonification, nitrification, denitrification, symbiotic and nonsymbiotic nitrogen fixation. Printed copies of synopses of lectures are furnished. Various texts are recommended as reference books.

*Laboratory.*—The laboratory work comprises the preparation of various special culture media and reagents necessary to conduct bacteriological analyses of the soil; qualitative analysis and the laboratory study of ammonification, nitrification, denitrification, symbiotic and nonsymbiotic nitrogen fixation; plot experiments and field work illustrating the influence of various factors upon the bacterial flora, and the inoculation of soil with symbiotic nitrogen-fixing bacteria. Printed laboratory directions are furnished.

7.—HYGIENIC BACTERIOLOGY. Elective, winter term. Lectures, two hours; laboratory, four hours. Four credits. Elective in the courses in home economics and general science. Prerequisite: General Bacteriology.

Pathogenic bacteria, especially those related to diseases of man; channels of infection, and means of dissemination of pathogenic bacteria; epidemics, their cause and control; isolation, disinfection, and quarantine; prophylaxis against specific infectious diseases, and important precautions necessary in the control of communicable diseases, are studied. Jordan's *Textbook of Bacteriology* is recommended as a textbook.

*Laboratory.*—The laboratory work comprises microscopical and cultural study of pathogenic bacteria; technique involved in the diagnosis of *Bacterium tuberculosis* in sputum; the culture of pathogenic anaerobic bacteria; the isolation and identification of pathogenic bacteria from animal tissues, from pus and exudates; bacteriological examination of air, water, milk, sewage; interpretation of results, etc.

8.—DAIRY BACTERIOLOGY. Elective, spring term. Lectures, two hours; laboratory, four hours. Four credits. Elective in the courses in agriculture and general science. Prerequisite: General Bacteriology.

Consideration is given to the bacterial flora of milk, butter, and cheese; to infectious diseases conveyed through dairy products; to bacterial contamination of milk by air, water, utensils, etc.; to normal and abnormal fermentations in milk, their significance and control.

*Laboratory.*—The preparation of culture media necessary for dairy bacteriological work; milk contamination; quantitative and qualitative bacteriological analyses of milk; the microscopical and cultural charac-

ters of the types of microorganisms representing the flora of milk, butter, and cheese; types of milk-fermenting organisms; the examination of cream, wash water, and separator slime; the effect of temperature on the growth of milk bacteria; pasteurization of milk; examination of milk for the presence of *Bacterium tuberculosis*, leucocytes and streptococci are taken up in the laboratory work. Various texts are recommended as reference books.

9.—BACTERIOLOGY OF POULTRY DISEASES AND POULTRY PRODUCTS. Elective, spring term. Lectures, two hours; laboratory, four hours. Four credits. Elective in courses in agriculture and general science. Prerequisite: General Bacteriology.

Consideration is given to the various microbial diseases of poultry; etiology, sources and modes of infection; prevention and cure; to the microbial content of freshly laid eggs, cold storage eggs, and egg products, with conditions tending toward increase or decrease of this content.

*Laboratory.*—Microorganisms pathogenic for poultry; artificial production, diagnosis and control of diseases in the laboratory; microbial content of eggs, and egg preparations produced and handled under various conditions, form the subject matter of the laboratory work. Laboratory directions are furnished.

10.—WATER PURIFICATION AND SEWAGE DISPOSAL. Elective, spring term. Lecture, one hour; laboratory, six hours. Four credits. Prerequisite: General Bacteriology or Sanitary Biology II.

The course comprises a study of the bacterial content of natural waters; of factors influencing the bacterial flora of the water; of bacterial indicators of pollution; of the collection and transportation of water samples; of methods of water purification and sewage disposal; of the application of water sanitation to rural homes and municipalities. Prescott and Winslow's *Elements of Water Bacteriology* and Savage's *Water Supplies* are recommended as textbooks.

*Laboratory.*—The laboratory work consists of quantitative and qualitative examinations, according to standard methods, of water and sewage samples; methods involved in the enumeration and identification of intestinal bacteria in water; laboratory study of conditions influencing the bacterial content and potability of water. Printed laboratory directions are furnished.

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## Botany

Professor ROBERTS  
Assistant Professor DAVIS  
Instructor MILLER  
Assistant WELLS  
Assistant MELCHERS  
Assistant POOLE

The instruction given in the Department of Botany has a threefold purpose:

First, general training in botany as an observational science, familiarizing the students with the meaning and relations of the manifold forms of plants, and the principles governing their life-processes. For those who wish to pursue the subject of botany professionally, excellent opportunities are offered to secure a broad and thorough training in the advanced courses given by the department.

Second, the importance of a scientific knowledge of the laws of plant life being fundamental in agriculture, it is sought in the elementary courses to provide such training as will generally fit the minds of agri-

cultural students to grasp the underlying meaning of familiar field work with crops; such training, moreover, as may be built upon in a carefully graded series of advanced courses.

The third phase of the work of the Department of Botany lies in the investigation of those economic problems in plant life which affect agriculture. Three distinct general lines of work in botany and plant breeding are being conducted in the Experiment Station: experimental plant breeding; the investigation, prevention and control of plant diseases; physiological investigations in drouth resistance; and seed control, *i. e.*, the determination of the purity and vitality of agricultural seeds for farmers, seedsmen, and others.

The equipment for elementary instruction comprises thirty compound and sixty-four simple microscopes, a series of Jung, Peter, Kny, and Frank botanical charts, a Bausch & Lomb projection apparatus, and a very full collection of preserved material for general morphology and pathology. For advanced work, Zeiss and Spencer microscopes with apochromatic lenses, a filar micrometer, a Bausch & Lomb camera lucida, a Zeiss drawing table, a Zeiss binocular microscope, and Bausch & Lomb simple microscopes of the highest grade, provided with special camera lucida attachment, are furnished for the use of the members of the staff and graduate students. A Minot precision microtome, Spencer microtome, embedding and sterilizing ovens, and the usual supplies of reagents and glassware, are provided for histological study.

In physiology, a complete equipment of the Ganong and the Cambridge lines of physiological apparatus and supplies is available. A large, well-equipped dark room, provided with a Folmer & Schwing enlarging, reducing and lantern-slide camera, a field camera of the best type, and a Bausch & Lomb photomicrographic apparatus, affords opportunity for the preparation of botanical photographs, lantern slides, illustrations for bulletins, etc.

In the Experiment Station laboratory are kept various instruments of precision employed in quantitative work in plant-breeding investigations, including special forms of apparatus used for taking measurements of organs, a specially designed gravimeter, an improved colorimeter, an Egli calculating machine, a Comptograph adding machine, a Corelli polar planimeter, specific gravity apparatus, numerous balances, the usual glassware, etc.

For general botanical reference there is an excellent herbarium, especially complete for the state of Kansas, and a very full collection of economic fungi. A very good botanical library is available, containing the usual standard texts and reference works, and files of the principal foreign journals.

## COURSES IN BOTANY

1.—GENERAL BOTANY. Freshman year, fall term. Class work, three hours; laboratory, four hours. Five credits. Required in the courses in agriculture and general science. Text to be selected.

This is a general introduction to botany. A careful study is made of the morphology of the chief great groups of plants, of their elementary physiology and ecology, and of the classification and geographic distribution of the plant kingdom, and its economic relation to man.

*Laboratory.*—The aim of the laboratory work in this course is to give as thorough a study as may be of the morphology of the chief important groups in the plant kingdom, taken in the order of their relative complexity, and of their probable relations to one another as parts of an evolutionary series. An excellent and very complete series of prepared slides is of assistance in this work. Laboratory outlines are furnished by the department.

2.—PLANT ANATOMY. Freshman year, winter term. Class work, three hours; laboratory, four hours. Five credits. Required in the courses in agriculture and general science. Text, *Plant Anatomy*, by W. C. Stevens.

This course comprises a detailed study of the anatomical structure of the organs and tissues of the higher plants, with especial reference to their origin and mode of development.

*Laboratory.*—The laboratory work consists of a microscopic study of the development of the growing plant, of the origin and differentiation of leaf, stem and root organs, and the development of the flower and the seed. A study is also made of the development of internal tissue systems, such as the vascular bundles, latex vessels, resin ducts, etc.; of the protective system of bark and cortex, and of auxiliary tissues, such as sclerenchyma or hard bast fibers, as in flax, hemp, etc. The purpose of the course is to familiarize the student thoroughly with the anatomical and structural characters of the seed plants from the developmental standpoint. Laboratory outlines are furnished by the department.

3.—PLANT PHYSIOLOGY I. Freshman year, spring term; sophomore year, winter term. Class work, two hours; laboratory, four hours. Four credits. Required in the courses in agriculture and general science. Prerequisites: General Botany; Plant Anatomy.

This is a course of lectures, combined with special study of a required text and with reference reading. The principal life functions of plants, such as photosynthesis, respiration, transpiration and growth, and the responses of plants to environmental conditions and physical stimuli, are studied in detail. In this course the student gains a general introductory knowledge of the functions and reactions of plants, and learns to regard them from the dynamic standpoint, as working organisms. Text, *Plant Physiology*, by C. R. Barnes.

*Laboratory.*—A series of typical experiments is followed out in the physiological laboratory and in the greenhouse. Each student is furnished with a set of the necessary apparatus, and learns to apply quantitative methods to the study of functions. Laboratory outlines are furnished by the department. Prerequisite: Laboratory work in General Botany and in Plant Anatomy.

4.—MEDICAL BOTANY. Sophomore year, fall term. Class work, one hour; laboratory, four hours. Three credits. Required in the course in veterinary medicine. Prerequisite: High-school Botany or General Biology.

This course involves a brief survey of the principal plants of the pharmacopœia. Especial attention is given to poisonous plants and their identification. Instruction is by lectures.

*Laboratory.*—This comprises microscopic study of plant products used as drugs, and a laboratory study of toxic plants. Laboratory outlines are provided by the department. Prerequisite: Laboratory work in Elementary Botany III.

5.—PLANT BREEDING. Junior year, winter term. Class work, two hours; laboratory, four hours. Four credits. Required in the course in agriculture; elective in the course in general science. Prerequisite: General Botany.



This subject involves a study of the present knowledge of variation and heredity as applied to the breeding and improvement of economic plants. The history of the principal theories bearing upon genetic problems is reviewed, and the experimental data are critically considered. The principles underlying the behavior of hybrids are discussed. A survey is given of the practical results achieved in the breeding of plants, together with a scientific analysis of the methods used. Text, *Genetics*, by Walter, supplemented by lectures and reference reading.

6.—ADVANCED PLANT BREEDING. Elective, fall term. Class work, three hours; laboratory, two hours. Four credits. Elective in the course in agriculture. Prerequisite: Plant Breeding.

The work of Plant Breeding is continued, with especial reference to the practical details, technique, and history of the breeding of the principal economic plants. Research work and reference reading in the literature of Mendelian investigations are required. A thesis involving a review of the work in some phase of genetics is required. A reading knowledge of German is essential.

7.—PLANT PHYSIOLOGY II. Elective, spring term. Lecture, two hours; laboratory work, four hours. Elective in the courses in agriculture and general science. Prerequisite: Plant Physiology I.

This course offers opportunity for advanced work upon special problems in plant physiology, to be selected by the department for investigation.

8.—ECONOMIC BOTANY. Elective, fall term. Class work, two hours; laboratory, four hours. Four credits. Elective in the courses in agriculture and general science. Prerequisite: Plant Morphology.

This course is designed especially for students intending to enter professional work in botany in experiment stations. It involves a study of the history of cultivated plants, with a course of lectures on the chief groups of the higher plants containing economic species. In this connection a very broad survey is taken of the world's economic plants, considerable attention being given to the derivation of economic products and to methods of cultivation and harvesting. The plants of tropical and subtropical agriculture and horticulture are given considerable attention. Forestry products are not considered. Text, *The Origin of Cultivated Plants*, by De Candolle. Lectures and reference reading.

*Laboratory.*—A microscopic study of economic plant products, such as fibers and textiles, food products, spices, etc. Laboratory outlines are furnished by the department. Prerequisite: Laboratory work in General Botany.

9.—PLANT PATHOLOGY I. Elective, fall term. Class work, two hours; laboratory, four hours. Four credits. Elective in the course in general science and agriculture. Prerequisite: Plant Physiology II.

The diseases affecting the chief economic crops of field, orchard and garden are studied in considerable detail. The etiology of the various diseases and their most evident symptoms are discussed, and the student learns to recognize at sight the principal plant diseases he is likely to encounter on the farm and in nursery, and in market-garden work. Physiological and bacterial diseases are considered to some extent, but the time is devoted chiefly to the more important diseases caused by the higher fungi, the life histories of which are studied in detail. Preventive measures are considered in each case, with special reference to the scientific principles underlying their application. An extensive collection of preserved pathological material and a large herbarium of exsiccatae of economic fungi are available. Text, *Fungous Diseases of Plants*, by Duggar.

*Laboratory.*—Detailed microscopic studies of diseased tissues, and identification of the fungus parasites which cause them, comprise the laboratory work. In the case of physiological diseases, the structural

changes induced in the tissues are worked out with the microscope. Laboratory outlines are furnished by the department. Prerequisite: Laboratory work in Plant Physiology II.

10.—PLANT PATHOLOGY II. Elective, winter term. Class work, two hours; laboratory, four hours. Four credits. Elective in the course in general science. Prerequisite: Plant Pathology I.

This is a continuation of Plant Pathology I, involving the study of laboratory and field methods in the investigation of plant diseases, the growing of pure cultures of parasitic fungi, the making of inoculations, etc. This course is especially designed for those who intend to pursue plant pathology as investigators in experiment stations. Lectures and reference reading.

*Laboratory.*—As described in the preceding course. Laboratory outlines are furnished by the department. Prerequisite: Laboratory work in Plant Pathology I.

11.—EVOLUTION OF PLANTS. Elective, winter term. Class work, four hours. Four credits. Elective in the course in general science. Prerequisite: Economic Botany, class and laboratory work.

Careful consideration is given to the lines along which evolution has proceeded in the plant kingdom, to the relationships of the more important phyla and to the probable derivation of the chief groups of plants. Text, *Evolution of Plants*, by Campbell. Lectures and reference reading.

12.—TAXONOMIC BOTANY. Elective, spring term. Class work, one hour; laboratory, six hours. Four credits. Elective in the course in general science. Prerequisite: General Botany.

This course is designed to give biological students a broad training in the systematic relationships chiefly of the flowering plants. Practice is acquired in the use of manuals or keys to floras, and the student is taught especially to recognize the morphological characters which distinguish the principal orders, families and genera of the angiosperms. The course is designed to be a strictly practical one, its purpose being to equip the student with the necessary data for recognizing at sight a large number of the plants of the field, mainly of the higher groups, although some attention is also paid to the identification of ferns, mosses, and liverworts, and of the commoner algæ and fungi. Lectures and reference reading.

*Laboratory.*—The identification, by means of standard manuals and floras, of a large number of native and exotic plants. Considerable field practice is required, and attention is directed to differences in structure which the same species may show under different environments. An endeavor is made to train the student's mind to a broad, comprehensive conception of species characters, using manuals merely as convenient guides to this end. Laboratory guide, *Gray's Manual of Botany*, seventh edition, revised. Prerequisite: Laboratory work in General Botany.

13.—SEED TESTING. Elective, spring term. Laboratory, two hours. One credit. Elective in the course in agriculture. Prerequisite: General Botany.

The student becomes familiar with the details of structure of the seeds of all the principal races of agricultural plants grown in this region, and learns to distinguish those seeds which are used as adulterants or as fraudulent substitutes. Considerable time is also devoted to the identification of weed seeds and of weed plants, in both the seedling and the adult stages. Practice work is given in making purity and germination tests of seeds, according to the official rules and methods for seed testing. Laboratory outlines furnished by the department.

## Chemistry

Professor WILLARD  
Assistant Professor KING  
Assistant Professor SWANSON  
Assistant Professor NEWMAN  
Assistant Professor HUGHES  
Assistant Professor BRUBAKER  
Assistant GUTSCHE  
Assistant MILLER  
Assistant MURPHY

All of the industries are becoming more and more dependent for their highest success upon intelligent application of the sciences, and the special sciences are making their greatest progress by tracing their phenomena back to the physical and chemical changes that accompany them. A study of chemistry and physics is therefore essential to any understanding of the processes of nature or of human industry. In the instruction in chemistry, the aim is to insist upon a mastery of the chief concepts of the pure science through the agency of textbook drill, accompanied by demonstrations in the lecture room, and experimental observations by the student himself in the laboratory. As the course proceeds, illustrations of chemical principles are drawn from the industrial processes of the chemical, agricultural, domestic, and other arts, thus impressing upon the mind the practical nature of the study. The ultimate object of instruction in this science is to develop in the student the power to form independent judgments upon the manifold problems of daily life in which chemistry plays a part.

The lecture rooms are amply equipped for experiments and demonstrations, and the laboratories are designed to accommodate 800 students per term in freshman work and qualitative analysis. The laboratories for more advanced work provide space for 100 students, and are well supplied with general and special facilities. The State work in foods, feeding stuffs, and fertilizers, and the chemical investigations of the Experiment Station in soils, crops, animal nutrition, etc., afford unusually good opportunities for students to obtain experience in practical chemistry.

### COURSES IN CHEMISTRY

1.—CHEMISTRY I. Lectures and recitations, three hours; laboratory, two hours. Four credits. Required in all courses. Prerequisite: Elementary Physics. Not open, as a rule, to students who have had a good high-school course in chemistry. See Chemistry Ia to IIIa.

This term's work begins the study of elementary inorganic chemistry, and includes a study of the elements oxygen, hydrogen, chlorine, and their compounds; this being accompanied by theoretical treatment of the subjects of matter, energy, properties of gases, chemical law and theory, solution, electrolytic dissociation, acids, bases, and salts, and chemical change as related to light, heat, and electricity. It is designed, with the succeeding terms, to give the student a knowledge of the fundamental principles of chemistry. As all subsequent progress in this science requires a working knowledge of its principal theoretical conceptions, the principles of nomenclature, the significance of formulas, chemical equations, etc., much attention is given to these, while at the same time the practical uses of the substances, and the processes used in metallurgy, engineering, agriculture, and other arts are emphasized. Newell's *Inor-*

*ganic Chemistry for Colleges* is used, this term's work covering the first 209 pages. The text is supplemented by lectures and is amply illustrated by experimental demonstrations.

*Laboratory.*—As far as time permits, the student performs independently experiments touching the preparation and properties of the more important substances. Preference is given to those operations which illustrate important principles, and the student is required, as far as possible, to study experiments in that light. In this, as in all other laboratory work in chemistry, the objects are to illustrate chemical phenomena and to teach care in manipulation, attentive observation, logical deduction, and discrimination and accuracy in recording results and conclusions. The student is required to give the designated amount of time, and a minimum amount of work must be satisfactorily performed in order to obtain credit. *Laboratory Exercises in Elementary Chemistry*, by William McPherson, is used as the laboratory guide.

2.—CHEMISTRY II. Lectures and recitations, two hours; laboratory, four hours. Four credits. Required in all courses. Not open, as a rule, to students who have had a good high-school course in chemistry. See Chemistry Ia to IIIa.

The work under this head is a continuation of the study of elementary inorganic chemistry, and includes the elements nitrogen, carbon, sulphur, and their compounds, and a consideration of atomic weights, valence, and the classification of the elements. These subjects are included in pages 210 to 355 of Newell's *Inorganic Chemistry for Colleges*.

*Laboratory.*—The laboratory work of this term is a continuation of that begun in the preceding term.

3.—CHEMISTRY III. Lectures and recitations, three hours; laboratory, two hours. Four credits. Required in all courses. Not open, as a rule, to students who have had a good high-school course in chemistry. See Chemistry Ia to IIIa.

This work completes the study of elementary inorganic chemistry begun in the preceding terms, and includes the consideration of fluorine, bromine, iodine, silicon, phosphorus, arsenic, antimony, and the metals.

*Laboratory.*—The laboratory work in this course is a beginning in qualitative analysis, for which McPherson's *Elementary Treatise on Qualitative Analysis* is used as the guide.

1a to 3a.—CHEMISTRY Ia, IIa, AND IIIa. These courses, covering three terms, are given for students who have had one year of high-school chemistry, but who did not obtain credit in Chemistry I and Chemistry II by examination. In the class-room work of these courses, *A Course in General Chemistry* by McPherson and Henderson is used as the textbook, and a more advanced course in laboratory work is given than that which accompanies the regular freshman work.

4.—QUALITATIVE ANALYSIS. Sophomore year, fall and winter terms. Lecture, two hours; laboratory, four hours. Four credits. Required in the courses in agriculture, veterinary medicine, home economics, and general science. Prerequisite: Chemistry III.

In this course the prime object is to increase the student's knowledge of chemistry as a whole. The standard methods of analytical chemistry are made the basis of a systematic study of the chemical properties of the most important metals, nonmetals, acids, bases, and salts. The teaching of analysis as such is a secondary object, although the student is held to the exact observations and careful reasoning required in ascertaining the composition of single substances and mixtures. The exercises, which are outlined in a special pamphlet, include a review of the more important topics of inorganic chemistry, in which natural occurrence of elements and compounds, industrial chemical processes, and analytical reactions are

seen to be closely connected. The exercises are so arranged as to pass from the simpler to the more difficult ones, and at the same time to facilitate the comparative study of the several cations and anions. The theories of chemistry receive constant application. The effect of the course is to broaden, strengthen, and unify the student's ideas of general chemistry, to enlarge greatly his knowledge of chemical facts, and at the same time to fix many of them in his mind by associating them with the reactions made use of in analytical processes.

*Laboratory.*—The regular methods of qualitative analysis serve as a basis for a laboratory study of the chemical properties of substances. Laboratory manual, *Qualitative Analysis*, by W. A. Noyes.

5.—ELEMENTARY ORGANIC CHEMISTRY. Sophomore year, winter term. Lectures and recitations, four hours. Four credits. Required in the courses in agriculture, home economics, and general science. Prerequisite: Chemistry III.

A systematic study is made of the simpler examples of the more important classes of organic compounds in their logical chemical relations. Such substances as touch the everyday affairs of life are treated in greater detail. Opportunity is thus afforded to consider the hydrocarbons, alcohols, organic acids, fats, soaps, sugars, starch, proteids, and other less-known substances. Compounds used for clothing, food, fuel, light, antiseptics, disinfectants, anesthetics, poisons, medicines, solvents, etc., are included. While especial attention is given to the useful organic compounds, the study of others is not excluded, when they contribute to an understanding of the systematic relations existing among the several groups. Any serious study of the biological sciences, or of the arts connected with them, must require this as a foundation, and a knowledge of the properties of organic compounds finds frequent application in engineering as well. The subject is amply illustrated by experiments in the lecture room. Text, Norris' *Organic Chemistry*, in part, accompanied by lectures amplifying certain parts of the subject.

6.—AGRICULTURAL CHEMISTRY. Sophomore year, spring term, and junior year, fall term. Class work, two hours. Two credits. Required in the course in agriculture. Prerequisite: Qualitative Analysis.

The work of this term consists chiefly of a detailed study of the application of chemistry to agricultural problems, with especial reference to the income and outgo of the elements which determine success or failure in crop production, and hence the agricultural prosperity of a country. The following topics are among those included: the atmosphere, the soil, natural waters, plants, farm manures, commercial fertilizers, crops, feeds, and animal products. Text, *General Agricultural Chemistry*, by Hart and Tottingam.

7.—QUANTITATIVE ANALYSIS I. Sophomore year, spring term, or junior year, fall term. Laboratory, four hours. Two credits. Required in the course in agriculture; elective in others. Prerequisite: Qualitative Analysis.

This consists of simple quantitative exercises, which are planned to give the student a knowledge of the simpler operations in quantitative analysis, as well as to lay the foundation for studies in which such knowledge is required. Quantitative analysis is at the basis of many investigations connected with agriculture, and the course is designed not only to increase the student's knowledge of chemistry, but to give him an appreciation of the value of exact quantitative work.

8.—QUANTITATIVE ANALYSIS II. Elective, junior year, fall or winter term. Laboratory, four hours. Two credits. Prerequisite: Quantitative Analysis I.

This consists of gravimetric determinations of silica, iron, aluminum, calcium, and magnesium in limestone; standardization of quantitative

apparatus; preparation of standard acid and alkali solutions of definite normality; and the determination of nitrogen in organic substances. Laboratory guide, *Notes on Quantitative Chemical Analysis*, by C. W. Foulk.

9.—QUANTITATIVE ANALYSIS III. Elective, junior year, winter or spring term. Laboratory, four hours. Two credits. Prerequisite: Quantitative Analysis I.

This consists of the gravimetric and volumetric determinations of phosphorus; the use of oxidizing solutions in volumetric analysis; the determination of iron in an ore; and the determination of potassium and carbon dioxide. Students expecting to take this course should plan to take it immediately after completing the work in Quantitative Analysis II. Laboratory guide, *Notes on Quantitative Chemical Analysis*, by C. W. Foulk.

10.—QUANTITATIVE ANALYSIS IV. Graduate or elective, senior year, fall, winter, or spring term. For each two hours' work a week for one term, one credit. Prerequisite: Quantitative Analysis III.

In this course the student may specialize on the analysis of foods, feeding stuffs, soils, fertilizers, or dairy products. As far as the student's preparation allows, he may take up the chemical study of a special problem. This applies particularly to graduate students.

11.—CHEMISTRY C. Sophomore year, winter term. Lecture, one hour; laboratory, eight hours. Five credits. Required in the course in civil engineering. Prerequisite: Chemistry III.

This course is designed to give students of civil engineering as much training in qualitative and quantitative analysis as time permits, the special direction given to the work being such as to lead to the greatest amount of practical benefit. Texts, W. A. Noyes' *Qualitative Analysis*, and Lincoln and Walton's *Quantitative Analysis*, supplemented by pamphlets and mimeographed matter.

12.—CHEMISTRY D-I. Junior year, fall term. Laboratory, four hours. Two credits. For students specializing in dairy husbandry. Prerequisite: Quantitative Analysis I.

This course includes calibration of volumetric apparatus, preparation of standard acid and alkali solutions of definite normality, and analysis of milk and butter. Laboratory guide, Lincoln and Walton's *Elementary Quantitative Analysis*, supplemented by special directions.

13.—CHEMISTRY D-II. Junior year, winter term. Laboratory, four hours. Two credits. For students specializing in dairy husbandry. Prerequisite: Chemistry D-I.

The course comprises determination of volatile fatty acids, of soluble and insoluble acids, saponification and iodine number of butter fat. These constants are determined on other fats also, as far as time permits.

14.—HOUSEHOLD CHEMISTRY. Senior year, fall term. Class work, one hour; laboratory, six hours. Four credits. Required in the course in home economics. Prerequisites: Qualitative Analysis and Elementary Organic Chemistry.

This course is designed to give the women in the home-economics course qualitative and quantitative work in the chemistry of the materials most intimately related to their daily life. Air, water, foods, fuel, fabrics, disinfectants, metals, and other materials used in and about the home are the subjects of numerous experiments touching their properties, usefulness and defects.

15.—HUMAN NUTRITION. Junior year, fall term or winter term. Class work, four hours. Four credits. Required in the course in home economics; elective in the course in general science.

This is a course in the chemistry of foods and nutrition, and includes, among others, the following topics: the composition of the body; the composition of foods and methods of investigation employed in their study; the changes that the several classes of foods undergo in cooking and digestion, and the functions that they perform in nutrition; daily food requirements, and the balancing of dietaries; food economy. *Chemistry of Food and Nutrition*, by H. C. Sherman, is used as a textbook, but is supplemented by lectures. Elementary Organic Chemistry and Physiology must precede this course.

16.—PRINCIPLES OF ANIMAL NUTRITION. Graduate or elective, spring term. Class work, four hours. Four credits. Prerequisite: Elementary Organic Chemistry.

This course gives a thorough study of the relations of animals to matter and energy. The methods of research and the results obtained are treated in an extended and scientific manner. Text, *Principles of Nutrition*, by H. P. Armsby.

17-19.—INORGANIC CHEMISTRY I, II, AND III. Graduate or elective; junior or senior year; fall, winter, and spring terms. Given in 1914-'15 and alternate years thereafter. Class work, three hours; laboratory, four hours. Five credits each term. Prerequisite: Qualitative Analysis.

This course consists of a thorough study of the facts of chemistry and their theoretical interpretation according to the views of the present day. Text, *Modern Inorganic Chemistry*, by J. W. Mellor.

20-22.—INDUSTRIAL CHEMISTRY I, II AND III. Graduate or elective; junior or senior year; fall, winter and spring terms, alternate years. Not given in 1914-'15. Class work, three hours; laboratory, six hours. Six credits each term. Prerequisite: Elementary Organic Chemistry.

This course consists of three hours a week of lectures and recitations in each term upon the more important technical chemical processes. Considerable attention is given to general operations, and the machinery employed. The more important commercial manufacturing industries are then taken up, including, with others, the production of alkalies, acids, glass, clay products, cement, paint, pigments, oils, varnish, soap, gas, paper, leather, petroleum, sugars, starch, and the products of fermentation, and the destructive distillation of wood and coal. Textbook, *Industrial Chemistry for the Student and Manufacturer*, by Rogers and Aubert.

23-25.—ORGANIC CHEMISTRY I, II, AND III. Graduate or elective; junior or senior year; fall, winter, and spring terms. Given in 1914-'15 and alternate years thereafter. Class work, three hours; laboratory, four hours. Five credits each term.

The course includes a careful, systematic study of the aliphatic and aromatic compounds to such an extent as the time permits. Text, *Theoretical Organic Chemistry*, by Cohen.

26-27.—PHYSIOLOGICAL CHEMISTRY I, II, AND III. Graduate or elective; junior or senior year. Given in 1913-'14 and alternate years thereafter. Class work, two hours; laboratory, four hours. Four credits each term. Prerequisite: Elementary Organic Chemistry.

A systematic and thorough study of the synthetic and analytical chemical changes that accompany the physiological processes of animals and plants. The chemical properties of food and body substances and their general and specific functions; the changes that take place in digestion, assimilation, and elimination, and the means by which these are brought about; enzymes and their functions; the blood and lymph; general metabolism and the interrelations of organs are among the important topics studied. Textbook, Abderhalden's *Text-Book of Physiological Chemistry*. Laboratory guide, Hawk's *Practical Physiological Chemistry*.

28.—JOURNAL MEETING. Once a week, throughout the year, the officers of the department, with the more advanced students and such others as wish to, meet for papers and discussion upon topics representing the progress of chemical science, chiefly as found in the current journals. The preparation of subjects for presentation at these meetings may be made a part of the credit work of advanced students.

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## Economics

Professor KAMMEYER  
Assistant Professor BAKER

Vocational training alone does not fully prepare a student for his life's work, nor for the acceptable discharge of his duties as a citizen. It is necessary that he should have at least a general knowledge of the social and economic conditions under which he works, in order that he may benefit society as well as himself. The State needs men and women trained for citizenship, and it is the purpose of this department to plan and to direct its work with this need in view.

A departmental library of well-selected books bearing on economics, sociology, and statistics is at the disposal of students, and is used for collateral readings, book reviews, and reports.

### COURSES IN ECONOMICS.

1.—ECONOMICS. Sophomore, junior or senior year, fall and spring terms. Class work, four hours. Four credits. Required in all courses except veterinary medicine.

A study of economic principles underlying the phenomena of wealth production, consumption, exchange, and distribution, including a general survey of the State in its relation to industry, transportation, public utilities, insurance, socialism, etc. Instruction by recitations and lectures. Text, Ely's *Outlines of Economics*.

2.—BUSINESS ORGANIZATION. Junior or senior year, winter or spring term. Class work, two hours. Two credits. Required in courses in the Division of Mechanic Arts; elective in the course in general science. Prerequisite: Economics.

A study of individual proprietorship, partnership and corporation as forms of business organization and management; the advantages and disadvantages of each, and legislative restrictions. The selling plans, advertising methods and systems of credits and collections used by typical manufacturing and distributive industries are made the basis of study and reports. Attention is given also to the origin and operation of markets and exchanges, cost accounting, and special systems of wage payment. Instruction is by recitations, lectures, and reports.

3.—AGRICULTURAL ECONOMICS. Senior year, winter term. Class work, four hours a week. Four credits. Optional in the course in agriculture.

This course is intended especially for students pursuing one of the agricultural courses, and in the main is similar to Economics, with the distinction that more time and emphasis are given to such subjects as rent, size of farms, ownership and tenancy, transportation to markets, agricultural credit associations, farm labor, and agricultural problems of an educational and social character. Instruction by recitations, lectures, and reports. Text, Carver's *Rural Economics*.

4.—HISTORY OF ECONOMIC THOUGHT. Elective, fall term. Class work, four hours. Four credits. Elective in the course in general science.

A study of the origin and development of economic ideas prior to the



time of Adam Smith, and of systems of economic thought subsequent to that time. The course is designed to supplement course 1 in economics, and the aim is to deepen the insight and broaden the view of the student touching existing economic phenomena and conditions, their origin, logical development and interrelations. Haney's *The History of Economic Thought* is used as a manual, but lectures, assigned readings and reports are the chief basis of instruction.

5.—LABOR PROBLEMS. Elective, winter term. Class work, two hours. Two credits. Elective in the course in general science. Must be preceded by a course in general economics.

The history, organization, functions and legal status of labor unions in the United States and the principal countries of Europe. Statistics and judicial decisions relating to strikes, boycotts, picketing, arbitration, etc., are subjects of study and investigation. The course also includes a study of the various plans that have been proposed and tried for the more equitable distribution of wealth, such as profit-sharing, coöperation, industrial partnership, etc. Instruction by lectures, assigned readings, and reports.

6.—MONEY AND BANKING. Elective, spring term. Class work, two hours. Two credits. Elective in the course in general science.

A study in detail of money, its history and characteristics as a medium of exchange and standard of value. Bank currency: its nature, forms and limitations. The principal banking systems of the world, their machinery and methods; branch banks, clearing houses, foreign and domestic exchange, etc. Special attention is given to the defects and needs of our own banking system, and to proposed plans for reorganization. A manual such as Scott's or White's *Money and Banking* is used, supplemented by lectures and library work.

7.—PUBLIC FINANCE. Elective, spring term. Class work, two hours. Two credits. Elective in the course in general science.

This course embraces a study of public revenues and public expenditures; the development of tax systems, reforms needed, public indebtedness, budgets, and other phenomena of financial administration. A manual such as Plehn's *Introduction to Public Finance* is used as a basis for recitations. This is supplemented by library work and reports. Must be preceded by a course in general economics.

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## Education

Professor HOLTON  
Associate Professor KENT  
Assistant Professor REISNER

The courses in this department have for their controlling purpose the professional training of teachers. Two types of courses are offered: (1) Courses that give the broad, fundamental principles upon which public education is based, and (2) courses that develop technique and skill in school management and the organization of the subject matter of the curriculum. All courses are based upon the proposition that education supported by public taxation should function in social and vocational efficiency.

A minimum of twenty-four credit hours is required in this department for the state teacher's certificate.

## COURSES IN EDUCATION

1.—PSYCHOLOGY. Junior or senior year, fall, winter or spring term. Class work, four hours. Four credits. Required for state teacher's certificate.

General introduction to the forms and laws of conscious experience as based on a knowledge of the physiological conditions of mental life. The work of the course will include the study of a text, outside readings, lectures and class experiments. Textbook, Pillsbury's *Essentials of Psychology*.

2.—HISTORY OF EDUCATION. Junior or senior year, fall or winter term. Class work, four hours. Four credits. Required for state teacher's certificate.

This course is intended to present the successive relationships that have existed between educational machinery and practices, and the changing political, economic, scientific, cultural and ideal environments from primitive times to the present. Textbook, Monroe's *Brief Course in the History of Education*.

3.—PRINCIPLES OF EDUCATION. Junior or senior year, fall, winter or spring term. Class work, four hours. Four credits. Required for state teacher's certificate.

Taking the purpose of education to be the preparation of the child for efficient participation in the life of society, the course aims at presenting the biological, psychological, economic, cultural and moral aspects of the educative process. Textbook, Reudiger's *Principles of Education*.

4.—TEACHING METHOD. Junior or senior year, winter or spring term. Class work, four hours. Four credits. Required for state teacher's certificate.

The aim of this course will be the development of good classroom technique through detailed study of child experiences as related to the larger demands of education. The work will include lectures, library assignments and observation of classes. A feature of the course will be individual reports and discussions. Prerequisites: General Psychology; Principles of Education.

5.—EDUCATIONAL PSYCHOLOGY. Junior or senior year, spring term. Class work, four hours. Four credits. Elective for state teacher's certificate.

The course will deal with those aspects of psychology that have a direct bearing upon educational practices. Special attention will be paid to the results of experimental investigations in this field. Lectures and library work. Prerequisites: General Psychology; Principles of Education.

6.—SCHOOL HYGIENE. Junior or senior year, winter or spring term. Class work, two hours. Two credits. Elective for state teacher's certificate.

The course includes a study of the school plant and equipment from the viewpoint of the mental and physical hygiene of the child; the standard tests for revealing the mental and physical defects of school children; the Simon-Binet test for mental measurements; school diseases and preventive measures.

7.—SCHOOL ADMINISTRATION. Junior or senior year, fall, winter, or spring term. Class work, four hours. Four credits. Required for state teacher's certificate.

This course is a study of the organization of state, city and county school systems, with special emphasis upon the rural and vocational schools; the interrelation of boards of education, superintendent, principal, and teachers. The school law of Kansas is also studied.

8.—PRACTICE TEACHING. Senior year, fall, winter, or spring term. Two hours. One credit. Required for state teacher's certificate.

Each candidate for a teacher's certificate is required to teach one hour a week for one term in the School of Agriculture; preparation and presentation of the subject matter of the curriculum are discussed.

9.—AGRICULTURAL EDUCATION. Senior year, fall, winter, or spring term. Class work, two hours. Two credits. Required of all candidates for state teacher's certificate who are preparing to teach agriculture.

This course is a study of typical secondary schools of agriculture and departments of agriculture in public schools; of land-grant colleges; of the making of a course of study in agriculture for elementary and secondary schools; of laboratory supplies and equipment; of the pedagogy of vocational subjects.

10.—INDUSTRIAL EDUCATION. Senior year, fall, winter, or spring term. Class work, two hours. Two credits. Required of all candidates for state teacher's certificate who are preparing to teach manual training, shop work, trade courses, and other industrial subjects.

This course is a study of typical secondary schools of industrial education and departments of industrial education in public schools; of the industrial schools of Germany; of the making of a course of study in industrial education for elementary and secondary schools; of shop equipment and cost; of the pedagogy of vocational subjects.

11.—HOME ECONOMICS EDUCATION. Senior year, fall, winter, or spring term. Class work, two hours. Two credits. Required of all candidates for state teacher's certificate who are preparing to teach home economics. See Division of Home Economics.

12.—RURAL EDUCATION. Junior and senior year, fall, winter, or spring term. Class work, four hours. Four credits. Elective for state teacher's certificate.

This is a course on the subject matter and methods employed in rural and agricultural education. An outline syllabus of the course is as follows: The development of agricultural education; agricultural colleges; écoles pratiques d'agriculture in France; Folkehojskoler in Denmark; agricultural schools in Wisconsin, Massachusetts, and other states; school gardens; organization of the course of study for rural high schools; extension service; rural schools and community service; district, township and county as units of school organization; consolidation of rural schools.

13.—EDUCATIONAL SEMINAR. Senior or graduate students, fall, winter, or spring term. One double period a week. The number of credits depends upon the time given to investigation and the quality of the work. Elective.

This course consists of research in rural and vocational education.

## The English Language

Professor SEARSON  
 Assistant Professor OSTRUM  
 Assistant Professor CRAWFORD  
 Instructor RICE  
 Instructor BOOT  
 Instructor LEONARD  
 Instructor DAVIS  
 Instructor SYFORD  
 Instructor WINSHIP

Ability to use language accurately, clearly and concisely is an essential part of the training of every educated person. The work of the Department of the English Language is to acquaint the student with the best standards of English practice, and to encourage him to maintain these standards in all his work. To this end the department offers studies in cultural and technical English and special drills in expressing thought freely and effectively in matters touching the vital interests of the student. The study of the English language is thus made the means of increasing the power and efficiency, and consequently the capacity for enjoyment, of the individual. It is the aim of the department, in co-operation with the technical departments of the College, to increase the knowledge and usefulness of the young workers of the State.

### COURSES IN THE ENGLISH LANGUAGE

1.—ENGLISH I. Freshman year, each term. Class work, four hours. Four credits. Required in all courses. Prerequisite: Graduation from a fully accredited high school, with three units in English, or the equivalent.

During the first week of the course, the student is given a series of classroom exercises to test his fitness to pursue the work of the course. Following these exercises, the student is given a rapid, thorough review of the essentials of English, followed by essays on simple themes designed to develop his ability to tell accurately and interestingly what he knows and to describe creditably what he sees. The chief object of the course is to enable the student to use clear-cut, correct English, to express his thoughts readily, accurately, and precisely on topics of vital human interest. Special consultations are held with all students, and special supplementary drills are given to all who need additional help.

2.—ENGLISH II. Freshman year, each term. Class work, four hours. Four credits. Required in all courses. Prerequisite: English I.

This course is a continuation of English I. In addition to continuing accurate drills, careful attention will be given to the making of plans, outlines, and abstracts, and to the proper construction of paragraphs and themes. So far as possible, the student will be shown how to get the most from the lecture or from the printed page, and will be trained to take notes properly. To give a natural incentive to proper oral and written expression, the fields of agriculture and country life, engineering, home economics, applied science, sociology, psychology and general economics are explored freely for topics of keen interest. The course is conducted with the central idea of assisting the freshman to acquire the habit of clear, accurate thought-getting and thought-expression in all his technical work.

3.—COLLEGE RHETORIC I. Freshman or sophomore year, each term. Class work, four hours. Four credits. Required in all except the engineering courses. Prerequisite: English II.

This course is a continuation of the work in English II. It includes a brief review of the essentials taught in English I and English II. In addition, special work in outlining, practical work in abstracting, directed library investigations, references and bibliography work, are required in order to assist each student to write and to speak effectively along the line of his own special interests and needs. Special drills in readiness and flexibility of thought-expression will be given by requiring a great deal of extemporaneous writing in the classroom. So far as possible, the work will be so arranged as to adapt itself to the special needs of the students of the several divisions.

4.—COLLEGE RHETORIC II. Sophomore year, each term; junior or senior year, fall term. Class work, four hours. Four credits. One term's work required in all except the engineering courses. Prerequisite: College Rhetoric I.

This course includes a brief review of the essentials of thought-expression, library investigation, bibliography work, logical arguments and orations. In addition, class reports upon projected engineering enterprises, explanations of mechanical and chemical processes, descriptions of new inventions by means of drawings and diagrams, special reports of significant agricultural experiments, and practical discussions of problems in home economics, are required. Attention is also directed toward the accurate and effective use of English in business letters, applications, shop reports, specifications, contracts, and bulletins. The work is adapted to meet the special needs of the students of the several college divisions.

5.—SPECIAL ENGLISH. This course is offered each term as supplementary to the courses in the School of Agriculture and in freshman English, and may be required of any student whose written work shows that he is unable to express his ideas clearly and accurately. Students may be admitted to the course by the head of the Department of the English Language upon the recommendation of the instructor and the student's dean. The course consists of special exercises, helps, and consultations, and may be continued in each case as long as is necessary to give the student the assistance needed.

6.—ARGUMENTATION AND DEBATE. Elective, fall term. Class work, four hours. Four credits. Elective in the courses in home economics, agriculture, and general science. Prerequisite: College Rhetoric I.

This course includes a systematic study of the theory of debate; brief-making; classroom practice in debating, in defending propositions, and in extemporaneous speaking; the proper methods of collecting and classifying material, and effective methods of refuting arguments. Special help is given to those desiring to participate in intercollegiate debates. Consultations, library investigations and special group conferences form helpful laboratory features of the course.

7.—BIBLE ENGLISH. Elective, fall term. Class work, four hours. Four credits. Elective in the courses in agriculture, home economics, and general science. Prerequisite: College Rhetoric I.

This course comprises a study of simple, forceful English based on Bible models. Short illustrative extracts, typical short stories, descriptions, clear explanations, and effective arguments are studied carefully to discover the secrets of simplicity, clearness and power of that great classic.

8.—ENGLISH PRACTICE. Elective, winter term. Class work, four hours. Four credits. Elective in the courses in home economics, agriculture, and general science. Prerequisite: College Rhetoric I.

This course offers advanced work in correct English practice. Definite work is assigned in practical, everyday English. The object of the course is to afford students special advanced training in the use

of English. The course is specially planned to meet the needs of those who intend to teach English, and of those who desire to record the results of technical investigations in the most effective form. Work done in other departments may be used as a basis of a part of the laboratory practice of this course. Regular conferences and consultations offer the student an opportunity to secure systematic personal help.

9.—FARM AND HOME ENGLISH. Elective, winter term. Class work, four hours. Four credits. Elective in the courses in agriculture, home economics, and general science. Prerequisite: College Rhetoric I.

This course is designed primarily to teach the plain, practical English indispensable to farm men and women who, by reason of special preparation for their work, expect to become leaders. This is a practice course in the essentials of useful, technical English, letter writing, farm reading and writing, and farm and club writing and speaking.

10.—BUSINESS ENGLISH. Elective, spring term. Class work, four hours. Four credits. Elective in the courses in agriculture, home economics, and general science. Prerequisite: College Rhetoric I.

This course comprises a thorough review of business letter-writing, exercises in writing contracts, notes, mortgages, wills, orders, sale bills, specifications, model story advertisements of farm produce, and a practice study of other forms commonly used in connection with the business of farm and home.

11.—APPLIED ENGLISH. Elective, spring term. Class work, four hours. Four credits. Elective in the courses in home economics, agriculture, and general science. Prerequisite: College Rhetoric I.

This course is a continuation of the one in English practice, and includes a study of correct standards and usage as applied in all branches of ordinary technical research. Definite assignments, carefully directed practice and advanced drills, and group studies showing the identity of higher theory and practice in English, are special features of the course. A series of the best texts will be used as the reference basis of the course.

12.—FARM ADVERTISING. Elective, fall term. Class work and practice, three hours. Three credits. Elective in the courses in home economics, agriculture, and general science. Prerequisite: College Rhetoric I.

How to advertise all kinds of farm produce in order to secure regular customers by parcel post or by direct delivery, is the object of this course. The student is shown how to write the most effective copy for "display ads.," "story ads.," and handbills, and how to feature the central point in each advertisement. The course includes the collection of the most important facts concerning farm produce and such study of markets and marketing as is necessary.

13.—FARM STORIES. Elective, winter term. Class work, three hours. Three credits. Elective in the courses in agriculture, home economics, and general science. Prerequisite: College Rhetoric I.

This course is designed to teach the student how to get the facts for a good farm "story" and how to write effective human-interest "stories" of farm life. Every phase of farm life is considered with the purpose of developing in the student the power to recognize the material for a good "story" and to write the "story" with vivid, effective appeal. The student is given extensive practice in setting forth the most interesting facts and incidents connected with farm life.

14.—FARM BULLETINS. Elective, spring term. Class work, three hours. Three credits. Elective in the courses in agriculture, home economics, and general science. Prerequisite: College Rhetoric I.

In this course the student is required to make an extensive study of farm bulletins and the essentials of writing good bulletins. How to write

in a simple, direct style that appeals to the readers for whom the bulletin is intended, is the subject of careful study. Current farm bulletins is made the basis for thorough drills in this special line. The student is permitted to take the facts he has collected in connection with the work of other classes and to use them in working out special reports required in this course. The course is designed especially for those who intend later to write clear-cut, practical, and effective farm bulletins.

15.—APPLICATIONS. Elective, spring term. Class work, one hour. One credit. Elective in the courses in agriculture, home economics, and general science. Prerequisite: College Rhetoric I.

This is a practice course designed to assist the seniors in the various courses in the College to write effective letters of application. The proper forms for letters of application for positions in the fields of industry will be taught the student in special practice drills.

16.—HOME ECONOMICS ENGLISH. Elective, fall term. Class work, four hours. Four credits. Elective in the housekeepers' course in home economics.

This is a study and conference course which will be varied to suit the needs of women in the housekeepers' course.

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## English Literature

Professor BRINK  
Assistant Professor GOOD

An ultimate purpose of the instruction in literature is to train students in the art of effective writing. No better way has yet been found for the accomplishment of such an end than the study and emulation of the great writers of the language. The courses seek to give the student an understanding of the nature and characteristics of literature in its leading forms, to develop in him a taste for noble expression and a desire to attain high ideals in his own writings, to develop in him the ability to judge with confidence the literary qualities of any given work, and through sympathetic study of masterpieces to give him some idea of the leading authors.

In most of the courses in literature the work is pursued by means of a combination of lectures, classroom study, and seminary investigation, accompanied, of course, by frequent written reports for criticism and discussion. The literature is read at first hand, and the student is required to interpret for himself as far as possible, with the idea that it is more profitable for him to know an author than to know what some one has said about that author. The extensive and intensive methods are combined—wide reading to obtain literary atmosphere and breadth of view; critical study to develop accuracy and insight.

### COURSES IN ENGLISH LITERATURE

1.—ENGLISH LITERATURE. Sophomore year, winter or spring term. Four hours a week. Four credits. Required in the courses in the Division of Mechanic Arts. Prerequisite: College Rhetoric I.

This course gives a brief review of the rise and development of English literature, with library study of periods and typical authors. Lectures are given on the nature of literature; the nature of poetry; linguistic and race contributions to the literature; the great literary periods. The work includes class study, reports, and the study of masterpieces.

2.—ENGLISH LITERATURE I. Sophomore or junior year, winter term. Four hours a week. Four credits. Required in the courses in industrial journalism, general science, and home economics; elective in other courses. Prerequisite: College Rhetoric I.

This course comprises an outline of the history of the language and literature. The students are required to prepare dissertations, both oral and written, on periods and types of literature, on representative writers, and on significant movements. Lectures are delivered on the following subjects: What is Literature? What is Poetry? Forms of Poetry; Criticism; The Beginnings of English Fiction; The Age of Scott, Burns, and Wordsworth; Tennyson and His Age. Members of the class report the lectures and apply principles in the actual study of suitable selections. The class carries on extensive study of such writers as Shakespeare and Thackeray out of class, and intensive study of somewhat difficult poetical selections in class, with reports and informal discussions.

3.—ENGLISH LITERATURE II. Sophomore or junior year, spring term. Four hours a week. Four credits. Required in the courses in industrial journalism, general science, and home economics. Prerequisite: English Literature I.

This is a continuation of English Literature I. The work includes: some plays of Shakespeare by the seminar method; reports and discussions; principles of Shakespearian criticism; linguistic elements and tendencies of the Lowland Scotch, with illustrations from the poetry of Burns. Critical study is made of typical productions of such writers as Shelley, Burns, Thackeray, Tennyson, Browning. The principles of Browning criticism are taken up.

4.—STUDIES IN ORATORY. Elective, fall term. Four hours a week. Four credits. Elective in courses that offer electives. Prerequisite: College Rhetoric I.

This course is a study of that type of oral discourse the ultimate purpose of which is to move the determination of hearers. The distinctions between spoken and written discourse are especially emphasized. The class examines and analyzes as many great speeches, especially of modern orators, as the time will permit. The course further includes the logic of oratory; study of oratorical style; and practice in the writing of speeches with a view to effective and persuasive utterance. Text, Brink's *The Making of an Oration*.

5.—THE ENGLISH DRAMA. Elective, winter term. Four hours a week. Four credits. Elective in courses that offer electives. Prerequisite: College Rhetoric I.

This is a study of the nature of the romantic, as distinguished from the classical, school of this great type of literature. The course is devoted mainly to Shakespeare, with reports and informal lectures on the drama before his time, and the reading of one or two plays of the subsequent period. The seminar method mainly is employed. The technique of the drama is studied, including character analysis, thought interpretation, and plot development.

6.—THE ENGLISH NOVEL. Elective, winter term. Four hours a week. Four credits. Elective in courses that offer electives. Prerequisite: College Rhetoric I.

This course is a study of the beginnings and development of this order of fiction; the laws of its art; its leading types, including the society novel, the historical novel, the novel with a purpose, the psychological novel, etc.; how to judge a novel. As many books as time will permit are read from typical authors, such as Jane Austen, Lytton, Scott, Dickens, Thackeray, Eliot, Charles Reade and others. The scientific method is followed, and the aim is to make the course as useful as possible to all who read novels and wish to make such reading profitable as well as interesting.



7.—NINETEENTH CENTURY LITERATURE. Elective, spring term. Four hours a week. Four credits. Elective in courses that offer electives. Prerequisite: College Rhetoric I.

This course is a study of the great writers of the Victorian period. Some attention is given to the Romantic Revival in English poetry, but most of the time is devoted to a first-hand study of Carlyle, Tennyson, Wordsworth, Browning, Shelley, and other writers of the period, who either expressed the life of their time or were leaders in shaping the life of their own or of subsequent years.

8.—AMERICAN LITERATURE. Elective, spring term. Four hours a week. Four credits. Elective in courses that offer electives. Prerequisite: College Rhetoric.

A rapid survey is made of the rise and development of American authorship from colonial times to our own day, with study of the lives, and criticism of the works, of representative men of letters, and intensive reading of their works so far as the time will permit. The transcendental movement and the Brook Farm experiment are considered. Seminar study is made of some of the great novels, longer poems, and speeches. The course includes Emerson's essays and poems.

9.—LITERATURE AND LABOR. Elective, spring term. Four hours a week. Four credits. Elective in all courses that offer electives. Prerequisite: College Rhetoric.

This course is arranged in recognition of the fact that much of the literature of the world is intimately related, either as cause or effect, to the work and progress of the race, and therefore to the heart of laboring man. It attempts, through the study of representative productions, to unfold this relation of literature to labor.

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## Entomology

Professor DEAN  
Instructor MCCOLLOCH  
Instructor MERRILL  
Assistant WELCH

In all courses a special effort is made to make the student realize that he is studying living things which form a part of his daily environment, and upon which his welfare in many cases vitally depends. In courses in which both class and laboratory instruction is given, the closest correlation is striven for, and wherever possible the same form is studied simultaneously in laboratory and class. The student is led to integrate his classroom knowledge with local animal life by means of frequent and carefully planned field excursions, and by the free use of vivaria in laboratory and museum. The courses offered are intended to awaken in the student a keen appreciation of the general principles underlying insect life, of the life economy of the more beneficial as well as of the more injurious species, and of the general principles governing methods for their control.

Standard anatomical charts, a representative collection (especially of local species), a high-grade lantern for the projection of lantern and microscope slides, a large and excellent series of lantern slides (many of them colored), and a series of microscope slides are available for illustration. (The lantern is used also for zoölogy and geology.) Compound and dissecting microscopes sufficient for the needs of laboratory classes have been provided.

## COURSES IN ENTOMOLOGY

1.—GENERAL ENTOMOLOGY. Junior year, spring term. Class work, three hours; laboratory, two hours. Four credits. Required in the agricultural courses. Prerequisites: General Zoölogy I and II.

This is a study of the elementary anatomy and physiology of insects, complete enough to give a thorough understanding of the life history and habits of the most important species and the general principles upon which the control of these economic forms is based. It is a study of the more important general facts about insects as a class; the main characters of the different orders and groups; how they have fitted themselves to survive and multiply; and how the structure and habits of one group render it susceptible to certain measures of control, while in other groups entirely different measures are necessary. The class work consists of lectures and of text and special reference study.

2.—INSECT MORPHOLOGY. Senior year, fall term. Class work, one hour; laboratory, six hours. Four credits. Elective in the courses in agriculture and general science. Prerequisite: General Entomology.

This is a study of the external anatomy of insects belonging to all the larger and more important orders and of the internal anatomy of one or two types.

3.—HORTICULTURAL ENTOMOLOGY. Senior year, winter term. Class work, two hours. Two credits. Elective in the course in agriculture. Prerequisite: General Entomology.

This is a study of the most important insect pests of orchard, garden, and forest, and of standard methods for controlling their ravages. The class work consists of lectures and the study of references.

4.—HOUSEHOLD ENTOMOLOGY. Senior year, winter term. Class work, two hours. Two credits. Required in the course in home economics. Prerequisites: General Zoölogy I and II.

This is a study of the elementary structure and physiology of insects complete enough to give a clear understanding of the life history, habits and methods of control of the principal insects injurious to house, garden, lawn, and human health. The course consists of reference study and a series of lectures.

5.—TAXONOMY OF INSECTS. Elective, winter term. Laboratory, eight hours. Four credits. Elective in the course in general science. Prerequisites: General Entomology and Insect Morphology.

This is a study of the general principles of the classification of representative insect forms. The purpose of this course is so to familiarize the student with the literature, methods, and ideals of classification that he will be able expeditiously to identify forms unknown to him and to pursue advanced taxonomic studies.

6.—GENERAL ECONOMIC ENTOMOLOGY. Elective, spring term. Class work, three hours; laboratory, two hours. Four credits. Elective in the course in general science.

This is a study of the life economy of the more important economic insects, of methods to be used in dealing with them, and of the literature of economic entomology. The student is made familiar with our present knowledge of the most important of our injurious insects, with the sources of economic literature, and with methods commonly used in the investigation of problems in economic entomology. The class work consists of lectures, and of text and special reference reading. Prerequisite: General Entomology.

*Laboratory.*—The laboratory work consists of the formation and study of a collection of injurious insects, and in insect breeding. This work naturally involves much field study, in the course of which the student gains a first-hand acquaintance with the more important injurious insects at home in nature.

7.—ADVANCED GENERAL ENTOMOLOGY. Graduate and elective, spring term. Four credits. The class work consists of lectures and assigned reading, together with demonstrations and field work. Elective in the courses in general science and agriculture. Prerequisite: General Entomology.

The purpose of this course is to give the advanced student a comprehensive view of the broad biological aspect of the subject and an understanding of the relation of insects to the complex of environmental factors. The various subdivisions of entomology will be correlated and used as a basis in the presentation of general principles as well as illustrating the problems of maintenance and the various ways in which insects have solved them. The course will include a somewhat detailed consideration of the following: anatomy as the basis for physiological considerations, embryology of insects, aquatic insects and their special adaptations, color and coloration, origin of adaptations, insects in relation to plants, to other animals, and to other insects, insects in relation to transmission of disease, insect behavior, geographical distribution, and geological distribution.

8.—MILLING ENTOMOLOGY. Elective, spring term. Class work, two hours. Two credits. Required in the course in milling engineering, elective in the courses in general science and agriculture. Prerequisite: General Entomology.

This is a study of the insect pests of flour mills, elevators, granaries, warehouses and bakeries, and of the standard methods to be used in dealing with them. The course consists of lectures and special reference reading. Inspection trips will be made to flour mills and warehouses.

9.—RESEARCH IN ENTOMOLOGY. The special student approaching graduation, if willing and capable, is drawn into the research work of the Experiment Station during the summer vacation, and during his last school year is encouraged to undertake the solution of a problem of his own. By this means his information is integrated with the practical problems which he must later meet. Prerequisites: General Entomology, and General Economic Entomology.

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## Geology

Professor NABOURS  
Assistant Professor NEWMAN

By use of abundant illustrative material, a special effort is made to make the student realize that he is dealing with natural forces which intimately affect his own well-being and that of his fellows. So far as conditions permit, the agencies that have made the earth what it is are observed and studied in the field. The purpose of these courses is to arouse in the student an appreciation of the general principles underlying the structure and formation of the earth.

Some charts, a large and excellent series of lantern slides, a representative collection of fossils and minerals, and a surrounding country exhibiting considerable variety of hill and valley, are available for illustrative purposes.

## COURSES IN GEOLOGY

1.—GENERAL GEOLOGY. Junior year, fall or spring term. Class work, four hours. Four credits. Required in the course in agriculture; elective in the course in general science.

This course consists of a brief study of the underlying principles of structural, dynamic and historical geology. The class work consists of lectures, and of a study of a text and references.

2.—ENGINEERING GEOLOGY. Junior year, spring term. Class work, four hours; laboratory, four hours. Six credits. Required in the course in civil engineering.

The class work in this subject consists in a study of the general principles of structural and dynamic geology, and of rocks in respect to their mineral composition, structural properties, changes in weathering, etc. It is given by lectures, textbook and references. Text, *Geology for Engineers*, by R. F. Sorsbie.

*Laboratory.*—The laboratory work comprises the observation and description of such structural and dynamic features as the locality affords, and a study of the principal rocks, and their mineral constituents.

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German

Professor CORTELYOU  
Instructor HEILMAN  
Instructor LIMPFF

In whatever direction the modern student turns his energies, a practical knowledge of German is found to be very useful—often quite indispensable. In the sciences, in the arts, and in literature, much of the newest and best work appears in German, so that he who would keep abreast of the times is forced to acquire at least the rudiments of the language. It is desired that the work of this department shall be as practical as possible, without, however, failing to encourage a fondness for German literature. The plan of instruction in general is a combination of the grammatical and conversational methods, each of which has its own special advantages.

A number of literary and scientific periodicals published in German are received by the College library, and afford the student a practical opportunity to amplify his knowledge of the language as derived in the classroom.

Students who have had German in the high school will be required, as a rule, to take more advanced courses as their elective or required work in German here.

## COURSES IN GERMAN

1.—ELEMENTARY GERMAN I. Sophomore year, fall or winter term. Class work, four hours. Four credits. Required in the course in home economics; elective in other courses.

After two periods given to the acquisition of the sounds of the German letters, the student at once begins reading. Vocabularies are learned from the outset, while grammar is acquired gradually through reading. Oral and written work and simple conversational exercises begin with the first reading lesson. In the work of this term there is included the study of articles, prepositions, declensions of pronouns, the indicative mode of the verb, and sentence order. Frequent reviews enable

the student to digest the facts presented, while the abundant conversation and written work subserves the same end. Text, Becker and Rhoades' *Elements of German* (first twenty-five lessons).

2.—ELEMENTARY GERMAN II. Sophomore year, each term. Class work, four hours. Four credits. Required in the course in home economics; elective in other courses. Prerequisite: Elementary German.

The remaining important points of grammar are studied. Students are repeatedly drilled on the grammatical constructions already emphasized in Elementary German I. The general plan of the work is the same as in the preceding term. Essential facts of grammar are insisted upon, but German is taught as a living language. Conversational exercises in German and written translations from English into German are frequent. Text, Becker and Rhoades' *Elements of German* (completed).

3.—GERMAN READINGS. Sophomore year, each term. Class work, four hours. Four credits. Required in the course in home economics; elective in other courses. Prerequisite: Elementary German II.

This course embraces readings of dialogue selections which deal in detail with German life, customs, history, and mythology. A few of the best and most popular song poems also are studied. Grammatical drill is continued, with occasional sight readings and translations into German. Conversations are based on the readings. Text, Bacon's *Im Vaterland*.

4.—GERMAN COMEDIES. Elective, fall or winter term. Class work, four hours. Four credits. Elective in the courses in general science, home economics, and agriculture. Prerequisite: German Readings.

The course comprises the reading of recent one-act comedies of literary merit, and of a realistic, lively and cleanly humorous nature, including the following: Julius Rosen's *Ein Knopf*, Gustav von Moser's *Ein amerikanisches Duell*, Hugo Mueller's *Im Wartesaal erster Klasse*, and Emil Pohl's *Die Schulreiterin*. Exercises in conversation and sight reading are occasionally introduced. Text, Manley and Allen's *Four German Comedies*.

5.—SCIENTIFIC GERMAN I. Elective, fall term. Class work, four hours. Four credits. Elective in the course in agriculture. Prerequisite: German Readings.

This course is designed as an introduction to the vast field of scientific publications appearing in German. It consists chiefly in translating miscellaneous scientific articles written in simple language. Texts to be selected.

6.—SCIENTIFIC GERMAN II. Elective, winter term. Class work, four hours. Four credits. Elective in the course in agriculture. Prerequisite: Scientific German I.

This is a continuation of the preceding course. The subject matter is here, however, restricted to the field of agriculture. Agricultural bulletins which have already appeared in Germany are read. Texts to be selected.

7.—GERMAN PROSE I. Elective, winter term. Class work, four hours. Four credits. Elective in the courses in general science and home economics. Prerequisite: German Comedies.

This is a practical course designed to give the student an intimate knowledge of everyday German as used among the Germans in their varied activities. The following are studied in this course: visits; the various stores; restaurants, and drinking customs; meals, and expressions used at table; boarding houses and hotels; the family, weddings, marriages, etc.; dress; the school system; religion and church life; divisions of society, occupations; money, measures, and weights; festivities; traveling; the postal system, the telegraph, the telephone; the city in

general; Berlin and cities of the provinces; the country; the German empire; the military system; conversational phrases; the best German; everyday German. There are occasional sight translations, and some conversational work is done. Text, Kron's *German Daily Life*.

8.—GERMAN PROSE II. Elective, spring term. Class work, four hours. Four credits. Elective in the courses in general science and home economics. Prerequisite: German Comedies.

This course is designed to give the student facility in the rapid translation of fairly easy prose. A number of modern short stories are read. Besides the more formal work, there are sight translations of easy selections. Text, Allen and Blatt's *Easy German Stories*, Vols. I and II.

9.—GERMAN CLASSICS. Elective, spring term. Class work, four hours. Four credits. Elective in the course in general science. Prerequisite: German Prose I or II.

This is a course introductory to a study of the German classics. Two or three of the simpler works of classic authors, such as Lessing's *Minna von Barnhelm* and Goethe's *Hermann und Dorothea*, are translated in the work of this term. Textbooks: Lessing's *Minna von Barnhelm*, edited by von Minckwitz and Wilder, and Goethe's *Hermann und Dorothea*, edited by Allen.

10.—TEACHERS' GERMAN. Elective, spring term. Class work, four hours. Four credits. Elective in the course in general science; elective, optional with German Prose II, in the course in home economics.

In this course a rapid but thorough review of the grammar is given, and composition work is carried on in connection with it. Sight translations and conversation also occupy part of the class period. Text, Bierwirth's *Elements of German*, and mimeographed matter furnished by the department. Prerequisites: At least five terms of college German or its equivalent. Germans who have not had the formal preparation for this course may be assigned to it upon obtaining the consent of the head of the department.

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## History and Civics

Professor PRICE  
Instructor TAYLOR  
Instructor ILES  
Instructor JAMES  
Assistant REYNOLDS

The Department of History and Civics offers nineteen different courses, as described below. Six of these are offered in the vocational schools, and are to be taken in the order designated, though each of these subjects is taught practically every term. The department is well equipped with maps and charts, and has, all things considered, an unusually strong library.

Training for citizenship, breadth of view, historic-mindedness, fairness of judgment, and general culture are constant aims of each course offered by the Department of History and Civics. As a result of the training received in these courses, the student is better prepared to understand and appreciate the institutions in the midst of which he lives and of which he is a part. He is also prepared to act more wisely his part as a leader in good citizenship wherever his lot may be cast.

## COURSES IN HISTORY

1.—ADVANCED ENGLISH HISTORY. Freshman or sophomore year, spring term. Class work, four hours. Four credits. Required in the courses in industrial journalism and general science; elective in the course in home economics.

This course traces the story of the growth of England from the Britain of the earliest time to the British empire of to-day. The political history is clearly traced, but emphasis is laid upon the constitutional development, and the practical working of the present government is carefully studied. Much emphasis is given to the industrial and social development of the people, especially to the more recent industrial revolution. One of the especially interesting features of this course is the study of England's institutions and government as her colonial empire emerged, and the conditions under which the United States of America became independent of England. While this is primarily a textbook course, with Cheyney's *Short History of England* as the text, supplementary reading is required, especially from Green's *Short History of the English People* and Cheyney's *Industrial and Social History of England*. As far as the limited time permits, lectures are given on contemporary continental institutions, movements, and conditions.

2.—FRENCH HISTORY. Elective, fall term. Class work, four hours. Four credits. Elective in the courses in home economics and general science.

The story of the growth of the French nation is traced from the days when Gaul was a Roman province, through the fall of Rome and the German conquest to the development of the Christian church and of the institution of feudalism. Then occurs a study of the Crusades, of the formation of the French nation, and of the beginnings of absolute monarchy, to the time of the emergence of France into a great European power. There follows a survey of the Hundred Years' War, of the Protestant Revolution, of the religious civil wars, and finally of the monarchy under Louis XIV. The study of the old regime in France, of the French Revolution, of Napoleon, and of the new nation, brings this course to the point where the course in Modern Europe begins. Text, Adams' *The Growth of the French Nation*, supplemented by special library assignments, and by lectures on medieval institutions.

3.—MODERN EUROPE. Elective, winter term. Class work, four hours. Four credits. Elective.

This is a study of the evolution of the modern European nations out of eighteenth century conditions, especial emphasis being laid on the period since the French Revolution. A study is made of the principal features of their present governments as actually conducted, together with the leading questions that are now agitating the several European states. An investigation is also made of existing international relations, and of the more important problems of the modern world, such as the Turkish problem, China, and the partition of Africa. Text, Robinson and Beard's *Development of Modern Europe*, Vol. II, and readings.

4.—ADVANCED INDUSTRIAL HISTORY. Sophomore year, fall term, or junior year, winter term. Class work, four hours. Four credits. Required in the courses in the Division of Mechanic Arts. (This course is also incorporated in courses 5 and 6.)

This course covers: (1) a study of the physical geography, geology, climate, etc., of the American continents and how these have affected American history and institutions; (2) a study of the discovery and colonization of America—the impelling motives, the life, occupations, religion, psychological temperament, political institutions, etc., of the people, of the attitude of the mother country toward colonization and the colonists, and of the later history of immigration; (3) the influence of the

frontier on American history and development; (4) a study of the South before the war (under slavery), and of the new South as it has been developed since the war, including a comparison of the South with New England and the West; (5) a study, running throughout the course, of the life and the industries or occupations of the people; (6) a review of the leading facts in the political history of the nation. This course is based on an American history notebook, prepared by the department; but special use is made of such texts as Bogart's *Economic History of the United States*, Coman's *Industrial History of the United States*, and Simon's *Social Forces in American History*. Instruction is given by means of lectures, assigned readings, and reports.

5.—AMERICAN HISTORY I. Junior or senior year, fall or winter term. Class work, four hours. Four credits. Required in the courses in general science, home economics, and industrial journalism; optional in the course in agriculture. (This course incorporates the first part of Advanced Industrial History.) Prerequisite (except by special permission): American Government.

This is an advanced course in the political, constitutional and industrial history of America to 1845. The course covers the conditions that led to the discovery of America; the period of discovery; the causes and development of colonization; the French and Indian War; the War of the Revolution; the struggles of the confederation period; the specific political, economic and industrial lines along which the nation has developed. This is a library course, and each student uses an American history notebook of topics and references prepared by the department, as an aid to larger, more definite and more thorough work.

6.—AMERICAN HISTORY II. Senior year, each term. Class work, four hours. Four credits. Required in the course in industrial journalism; elective in other courses.

The work of this term continues the course in American History I down to the present time. It includes a study of the annexation of Texas and the Mexican War, with the resulting slavery issue; the compromise of 1850; the Kansas-Nebraska bill and the early Kansas struggle "to the stars through difficulties," including the various constitutions and the final admission to statehood; the origin of the Republican party; the election of 1860; secession; a comparative study of the North and the South before, during, and after the war; a study of some leading features of the war, including financial questions and foreign relations; reconstruction—political, social, and industrial; presidential elections, especially that of 1876; and finally, a study of the Spanish War and of America's new position as a world power. The American history notebook is continued. Emphasis is given to the industrial phases of American history, in an effort more clearly to understand and appreciate the present industrial age. This course incorporates the latter part of Advanced Industrial History. Prerequisite: American History I.

7.—EUROPEAN INDUSTRIAL HISTORY. Senior year, spring term. Class work, four hours. Four credits. Elective in the courses in the Division of Agriculture.

This course includes especially the industrial and social history of England, the industrial life and institutions of the middle ages, and a survey of the most important phases of the industrial conditions in modern Europe, and in China, Japan, and the Philippines. It includes the essential features of the history of civilization—the chief elements in the story of human progress. Based primarily on such texts as Cheyney's *Industrial and Social History of England*, and Innes' *England's Industrial Development*. Supplemented by lectures and reference work.

8.—HISTORY OF HOME LIFE AND THE LAW OF DOMESTIC RELATIONS. Junior or senior year. Class work, four hours. Four credits. Elective in the course in home economics.



The character of this course is suggested by the title. It certainly includes essential features of the history of civilization, and traces the story of human progress from the dawn of history to the present moment. The course is now in preparation, and will be offered in the near future. It will be based on a combination of texts, lectures, and library readings.

9.—KANSAS HISTORY. Elective, spring term. Class work, two hours. Two credits.

This course covers the history of Kansas from the beginning down to the present time, with emphasis on the period of statehood. The conquest of the frontier, the building of the state, and the social, industrial, and political advance to the present day are studied. This is a library course, based on outlines and references furnished by the department.

10.—ANCIENT HISTORY. Class work, four hours. Four credits. Elective. Open to all students who can satisfactorily carry the work.

This is intended primarily for those who expect to teach this subject in the high schools. It includes a study of the ancient world, its industries, art, literature, and government. The course will be based on one of the standard modern texts, and is intended to familiarize the student with the best modern literature on the subject.

11.—IMMIGRATION AND INTERNATIONAL PEACE. Class work, one hour. One credit. Elective. Students may attend this course without special assignment, but regular assignment and attendance on at least ten lessons of this course is required in order to get any college credit.

The title of the course suggests its character. One of the most important questions confronting our nation to-day is that of immigration. Possibly the most interesting question in world politics is that of international peace, as compared with the heavy burden of military and naval armaments, and the awful cost of war.

## COURSES IN CIVICS

1.—AMERICAN GOVERNMENT. Junior or senior year, fall, winter or spring term. Class work, four hours. Four credits. Required in the courses in agriculture, home economics, general science, and industrial journalism.

This course in civics, or actual government, reviews definitely the fundamental principles and operations of our state and national governments, including the essential principles of constitutional law, but gives special emphasis to the actual present-day conditions and movements in our governmental and political life. Among the subjects especially studied are the initiative and referendum, suffrage and primary elections, the recall, city government and government of territories, the regulation of commerce, conservation of national resources, national defense, taxation and finance, the actual methods of congressional activity, and the function, organization, power, and importance of political parties in our government. The course is primarily based on such texts as Beard's *American Government and Politics* and Hart's *Actual Government*.

Throughout this course special and definite attention is given to recent and current events in governmental activities.

2.—BUSINESS LAW. Junior year, winter or spring term. Class work, two hours. Two credits. Required in all the courses in the Division of Mechanic Arts; elective in other courses.

This course is planned to give, primarily, a definite knowledge of the essentials of the law of contracts, followed by a briefer study of agency, bailments, and carriers, the law of sales and of negotiable instruments; secondly, the elements of the law of real property, including study of deeds, mortgages, leases, franchises, rights of way, and water rights; finally, a brief study of patent rights and of torts, especially the law of negligence. Text, Hufcut's *Elements of Business Law*.

3.—FARM LAW. Elective, spring term. Class work, two hours. Two credits. Elective in the course in general science and in the course in agriculture.

This course outlines the following subjects as far as the time permits:

*First.* The title to the farm—deeds, etc.; boundaries of the farm—fences, etc.; water rights, including irrigation; police power of the State—quarantine, destruction of diseased animals, pure food; live stock—liability of owner, trespassing animals, estrays. *Second.* Contracts, including hired help, etc.; farm crops and their ownership; renters; sales, including warranty, etc.; factories, or commission merchants; common carriers, such as railroads; insurance. The course is based on Green's *Law for the American Farmer*, supplemented by the Kansas statutes.

4.—INTERNATIONAL LAW. Elective, winter term. Class work, two hours. Two credits. Elective in the course in general science.

The fundamental principles of international law and international relations, and rights and obligations, public and private, in time of peace and in time of war, are studied, especially in the light of recent developments, such as the Hague conferences. Text, *Wilson on International Law* (*Hornbook Series*, 1910).

## Industrial Journalism

Instructor SMITH, in Charge  
Assistant DETWILER

The purpose of the course in industrial journalism is to give greater facility in the use of English, with especial reference to the demands of newspapers, farm publications and magazines, in disseminating information concerning agriculture and the industries generally.

Instruction in industrial journalism does not begin until the junior year, and students desiring to take it must come prepared with the necessary training in English and other fundamentals of such a course. They will be required, also, to conform to a schedule of optional courses particularly suited to this profession, and certain to be valuable to them after they leave college. Special students with the necessary prerequisites will be admitted.

A series of lectures describing the theory and practice of journalism is continued throughout the two years. Especial emphasis is given to the industrial branch of the profession. A part of every lecture hour may be used for criticism or special instructions to the class.

### COURSES IN INDUSTRIAL JOURNALISM

1.—ELEMENTARY JOURNALISM. Junior year, fall or spring term. Class work, two hours. Two credits. Required in the courses in industrial journalism and agriculture; elective in other courses.

In this course the students learn the first principles of the profession as they are acquired in actual service. Examples of industrial writing, good and bad, are presented for consideration; farm journals and their ideals and requirements are discussed; and the students are told just what to do and how to do it under given circumstances.

2.—FARM WRITING. Junior year, winter term. Class work, two hours. Two credits. Required in the course in industrial journalism; elective in other courses. Prerequisite: Elementary Journalism.

This course contemplates the most careful instruction in preparing material for publication in daily and weekly papers throughout the State, and in farm journals. The work covers the principal points and objections noted by editors of both classes of publications, and gives particular attention to suggestions leading to the development of attractive features in stories of agriculture, home economics, and mechanic arts, and in campus news. The ordinary laboratory or practice work incidental to assignments is continued. Attention is given livestock advertising and illustrations.

3.—GATHERING NEWS. Junior year, spring term. Class work, two hours. Two credits. Required in the course in industrial journalism; elective in other courses. Prerequisite: Farm Writing.

The lectures and work of this course are designed to familiarize students with the requirements of newspapers in small cities and towns in respect to the matter of gathering and presenting current events. A part of the term is given to consideration of the principles and problems of country journalism.

4 to 9.—JOURNALISM PRACTICE I TO VI. Junior and senior years; four hours. Two credits, each term. Required in the course in industrial journalism; elective in other courses. The prerequisite for each term is the work of all preceding terms in Journalism Practice.

Journalism practice consists in gathering information, or news, to which the students have been assigned, and in writing the stories, or articles, in the department workroom. Assignments are given at regular periods and must be accounted for exactly as in a newspaper office, or as in any college course in which certain tasks are performed in the presence of the instructors. The students write articles for *The Kansas Industrialist*, the official paper of the College, and for farm journals and newspapers, describing the work of the Experiment Station, and the industrial work of the various departments. At least one article, and in emergency, two or more articles, must be written every week. In proportion as they advance, the students do more important laboratory, or practice, work. They are required to write special stories and editorials, and in every possible way conduct the actual business of a newspaper office. References are looked up, and special articles prepared for publication under personal supervision. Special instruction is given in the use of technical and semitechnical expressions in writing, with a clear understanding of their meaning. In this way students learn to avoid many of the errors inevitably made in newspaper articles written by persons unfamiliar with the phraseology of the professions.

10.—COPY READING. Senior year, fall term. Class work, two hours. Two credits. Required in the course in industrial journalism; elective in other courses. Prerequisite: Gathering News.

This work teaches the students how to detect, avoid and correct the common errors in newspaper writing. The lectures cover practically every point encountered in many types of publications. In this part of the course students learn how to emphasize in the headlines the most important and interesting features of a manuscript. Special attention is given advertising, type faces, and the work of making up a newspaper.

11.—NEWSPAPER LAW. Senior year, winter term. Class work, two hours. Two credits. Required in the course in industrial journalism; elective in other courses. Prerequisite: Copy Reading.

This course is intended to supply the most valuable instruction in the law covering the conduct of newspapers and other publications, particularly with respect to libel. One half the class periods are given to the history of newspapers in the United States and to the law of copyright. The ethics of the profession, invaluable to every one desiring to write for the press, are discussed. The students continue their agricultural and industrial writings as in the other terms.

12.—EDITORIAL PRACTICE. Senior year, spring term. Class work, two hours. Two credits. Required in the course in industrial journalism; elective in other courses. Prerequisite: Newspaper Law.

A cultural course designed to broaden the student's viewpoint as to the conduct of the editorial department of newspapers and farm journals, as to the theories that underlie its work, and as to the factors and influences that control it. To encourage the formation of opinion and to stimulate thought, acceptable contributions written by the students are printed in the College paper. A part of the term is given to a study of the history of agricultural journalism in the United States.

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## Library Economy

Librarian SMITH  
Reference Librarian DERBY  
Research Assistant GERIQUE

The library supplements the work of every department of the College. It is a storehouse of knowledge for every student. It supplies information and the latest results of scientific research for every instructor. The library is thus essential to the College, forming, as it were, a center from which its various activities radiate.

In order that the library may perform its functions with the highest degree of efficiency it is necessary that instruction be given regarding its use. With this thought in mind a course is offered the purpose of which is to familiarize the student with scientific, up-to-date methods in the use of books and to acquaint him with the best general reference books as well as with standard works on various subjects. Placed at the beginning of his College course it should tend to increase largely his efficiency in study throughout the entire course.

## COURSES IN LIBRARY ECONOMY

1.—LIBRARY METHODS. Freshman or sophomore year; fall, winter or spring term. Class work, one hour; laboratory work, two hours. Two credits. Required in the courses in general science, agriculture, and home economics.

The course consists of lecture and laboratory work on classification and arrangement of books in the library; card catalogues; the principal works of reference, such as dictionaries, encyclopedias, atlases, handbooks of general information, handbooks of geography, history, literature, economics, quotations, statistics, etc.; public documents and their indexes; indexes to periodicals; trade, national and subject bibliographies, etc. Instruction is given also in methods of indexing current technical reading for purposes of future reference.

2.—LIBRARY METHODS E. Freshman year, spring term. Laboratory work, two hours. One credit. Required in all courses in the Division of Mechanic Arts.

This course is similar to that listed above, but consists of laboratory work only. It is not an equivalent of Library Methods, and may not be substituted for it.

## Mathematics

Professor REMICK  
Associate Professor ANDREWS  
Assistant Professor WHITE  
Assistant Professor PORTER  
Assistant Professor STRATTON  
Instructor ZEININGER  
Instructor CLEVENGER  
Instructor FEHN  
Assistant HOLROYD

In an institution that stands as an exponent of the industrial type of education, mathematics should occupy an important place. Training in the exact science is valuable not only for its own sake but also on account of its manifold applications. On this basis the courses in mathematics are offered primarily with the following ends in view: (1) the attainment of mental power and accuracy in the interest both of general culture and special application; (2) the acquirement of facts and processes that will provide the student with an indispensable tool for further scientific and technical study.

Freshman courses are offered each term, sophomore courses at least twice during the year.

### COURSES IN MATHEMATICS

1.—PLANE TRIGONOMETRY. Freshman year, fall term. Four hours. Four credits. Required in the courses in engineering, architecture, and general science. Prerequisite: Solid Geometry; Algebra IV (or equivalent).

This course treats of the functions of acute angles, right triangles, goniometry, oblique triangles, practical problems. Text, Rothrock's *Plane and Spherical Trigonometry*.

2.—COLLEGE ALGEBRA. Freshman year, winter term. Four hours. Four credits. Required in the courses in architecture, engineering, and general science.

Elementary topics, functions and their graphs, quadratic equations are rapidly reviewed. The further treatment includes the subjects of complex numbers, theory of equations, permutations and combinations, partial fractions, logarithms, and determinants. Text, *Higher Algebra*, by Hawke.

3.—ANALYTICAL GEOMETRY. Freshman year, spring term. Four hours. Four credits. Required in the courses in architecture and engineering; elective in the course in general science. Prerequisites: Plane Trigonometry and College Algebra.

This course treats of coördinate systems, projections, graphical representation, loci, straight line, conics, parametric equations, maxima and minima, empirical equations. Emphasis is placed upon graphical work. Text, *Brief Course in Analytic Geometry*, by Tanner and Allen.

4.—CALCULUS I. Sophomore year, fall term. Four hours. Four credits. Required in the courses in engineering; elective in the course in general science. Prerequisite: Analytical Geometry.

This course includes a study of fundamental ideas, a thorough treatment of the processes of differentiating standard elementary forms with applications to geometry and mechanics. Maxima and minima, differentials, and rates are discussed in connection with practical problems. Text, *Differential and Integral Calculus*, by Granville.

5.—CALCULUS II. Sophomore year, winter term. Four hours. Four credits. Required in the courses in engineering; elective in the course in general science. Prerequisite: Calculus I.

The chief topics considered are curvature, mean value theorem, partial differentiation, expansion of functions, integration of standard algebraic and transcendental expressions, definite integrals, rational fractions, and integration by parts. This course contains problems closely related to the work of engineering students. Text, *Differential and Integral Calculus*, by Granville.

6.—CALCULUS III. Sophomore year, spring term. Four hours. Four credits. Required in the courses in engineering; elective in the course in general science. Prerequisite: Calculus II.

In this division of the subject the emphasis is laid on the application of calculus to practical problems. Problems involving areas, lengths, surfaces, and volumes are treated by processes of single integration. The idea of successive and partial integration is applied to areas, moments, centers of gravity, surfaces, volumes, etc. The types of differential equations which the student of engineering is most likely to meet with in his subsequent work are briefly discussed. Text, *Differential and Integral Calculus*, by Granville.

7.—SPHERICAL TRIGONOMETRY. Junior year, fall term. Two hours. Two credits. Required in the course in civil engineering. Prerequisite: Plane Trigonometry.

The usual formulas employed in the solution of right and oblique spherical triangles are here discussed. After familiarity with the formulas has been gained through the medium of abstract examples, a brief course of applications follows, including in particular problems of astronomy.

8.—CALCULUS. Junior year, winter term. Four hours. Four credits. Elective in the course in general science. Prerequisite: Analytical Geometry.

This course is designed especially for students intending to teach secondary mathematics. It includes a brief treatment of the fundamental principles of both branches of calculus, practice with the standard formulas of differentiation and their application to geometry and to practical problems involving maxima and minima, rates, etc. Integration of the usual elementary forms is followed by the idea of the definite integral and a few of the more important applications.

9.—TEACHERS' COURSE IN MATHEMATICS. Junior year, spring term. Four hours. Four credits. Elective in the course in general science.

As its name indicates, this course is intended primarily for those who are planning to teach elementary mathematics. Emphasis is given to pedagogical questions, with some reference to the historical course of development. A discussion of the best methods of teaching arithmetic, algebra, and geometry, a study of the reports of prominent mathematical organizations, especially those of the international commission, a comparison of curricula in different schools, these are some of the matters which receive consideration. An examination is made of books and articles on the teaching of mathematics. The course proceeds by lectures, reading, and reports on assigned topics.

10.—ANALYSIS OF STATISTICS. Senior year, fall term. Four hours. Four credits. Elective in the course in agriculture.

The special purpose of this course is to acquaint students of agriculture, who may have occasion to make use of statistical tables of various sorts, with the modern mathematical methods of treatment. Use is made of farm bulletins, agricultural reports, etc., by means of lectures, readings, and recitations.

11.—MATHEMATICS OF BIOLOGY. Senior year, spring term. Four hours. Four credits. Elective in the course in general science. Prerequisite: Analytical Geometry.

Elements of differential and integral calculus, curve plotting, and determination of equations of curves, are here considered. This course is designed to meet the needs of students in biology and is taught largely by the lecture method.

12.—GRADUATE COURSES. In addition to the preceding undergraduate courses, more advanced work in mathematics is offered for candidates for the master's degree. Courses are given in the following subjects: Advanced Calculus, Solid Analytical Geometry, Differential Equations, Theory of Equations, Theory of Functions of a Complex Variable, Modern Analytical Geometry, and Theoretical Mechanics.

## Military Training

Second Lieutenant HILL, Professor of Military Science and Tactics  
Commissary Sergeant CLAEREN (U. S. A., retired), Assistant  
B. H. OZMENT, Band Leader

Since this College is one of the beneficiaries of the act of Congress of 1862, military tactics is required in the College curriculum. All young men under twenty-five years of age are required to take military drill three full hours a week for two years, unless excused from a part of this on account of membership in College athletic teams. (See Physical Education.)

The course of instruction is concisely stated in General Orders No. 231, War Department, 1909, as follows:

"The main object of military instruction given at civil educational institutions having army officers as professors of military science and tactics will be to qualify students who enter the military departments of such institutions to be company officers of infantry, volunteers, or militia."

In compliance with this general requirement, the course of instruction is divided into practical and theoretical work, arranged as follows:

*a.*—Practical:

Infantry drill, including school of the battalion.

Butts' Manual, with music.

Signal drill: International Morse code.

First-aid drill.

Minor tactics: advance and rear guard, outposts, patrolling, and marches.

Target practice.

Ceremonies: parade, guard mounting, review, inspection, funeral escort, and escort to the colors.

*b.*—Theoretical:

Company administration for cadet officers.

War Department manuals.

Lectures.

Students under military instruction are organized into a battalion or a regiment of infantry, the organization, drill, and administration of which conform to that of the army.

Since the number of students assigned to military drill is sufficient to maintain a battalion organization, a band is also provided, the members of which must be thoroughly trained in the drill of the school of the squad. Assignments to the band are made upon request of the band leader, who is charged with the technical instruction.

Officers and noncommissioned officers are selected by the Professor of Military Science and Tactics, with the approval of the President. This selection is made from among those cadets who have been the most studious and soldierlike in the performance of their duties, and the most exemplary in their general deportment. In general, the cadet captains and lieutenants are taken from the senior class, the sergeants from the junior class, and the corporals from the sophomore class.

The degree of excellence attained in military drill by the corps of cadets is limited wholly by the state of discipline existing in the corps. Therefore, military discipline, as far as compatible with College regulations, is rigidly enforced during the hour allotted to military work; and it is impressed further upon all cadets that their actions and behavior at times other than the hour for military drill should be regulated by the standards of honor and duty inculcated in military discipline. Each cadet is furnished with a copy of the Regulations for the Corps of Cadets, Kansas State Agricultural College, and is expected to conform to the rules and requirements of the same.

All young men in College courses below the junior year, unless excused by reason of physical disability, are required to take military drill, and to complete the work of each term in a satisfactory manner. All requests for credit, for excuse on surgeon's certificate of permanent disability, or for postponement because of exceptional circumstances, are made to the President through the Commandant of Cadets, who thoroughly investigates each case on its merits and forwards the request, with his recommendations, for executive action. Additional work is optional with seniors and juniors, who are given preference for appointments as cadet officers and noncommissioned officers. A senior or junior having enrolled optionally, and having accepted a commission or warrant, is required to continue the work throughout the College year, subject to the same regulations as other cadets.

The uniform conforms generally to the West Point pattern. The cost of cap, blouse, and trousers varies from \$15 to \$18. This expenditure actually represents an economy, as the young man receives an excellent well-fitting suit, durable in texture and build, which gives him at all times a well-dressed appearance. The uniform must be purchased immediately after enrollment. New cadets, after being assigned to military drill, report at once to the office of the Commandant of Cadets for measurement, and then make their cash deposits to cover the cost of the uniform. The buying of old or of second-hand uniforms is absolutely prohibited, and they will not be accepted as satisfactory uniforms by the Commandant of Cadets.

At the close of the year the names of the cadets most distinguished in military science and tactics are reported to the War Department, and also to the adjutant-general of the State of Kansas.

To the cadets completing the full course in military science and tactics, many excellent opportunities are offered. These young men are well prepared to stand examinations for commissions in the regular service or in the Philippine constabulary, and their training at this institution makes of them efficient subalterns. In addition to such positions, opportunities exist for affiliation with the National Guard of the State. The War Department is in fact now preparing a plan whereby certain honorably mentioned graduates of institutions of this character may be commissioned in the National Guard.

The Department of Military Training offers elective courses as follows: Small-arm Firing Regulations; Field-service Regulations; Camp Sanitation; Guard Manual; Field Engineering; First Aid to the Injured.



## Music

Professor VALLEY  
 Assistant Professor BROWN  
 Assistant BAUM  
 Assistant FING  
 Assistant BIDDISON  
 Assistant BAIRD  
 Assistant EASTER  
 Band Leader OZMENT

Recognizing the importance of music in daily life, the power, cultural influence, inspiration, and pleasure it affords, and the necessity of musical knowledge for those who intend to enter the profession of teaching, this College offers to the earnest student a good opportunity for the study of music.

No regular or required course is given. The student may take music for one term only, or for an extended period of four years. Instruction is furnished free to all regular students assigned to class work in the following branches: voice, piano, violin, wind and brass instruments; notation, theory, harmony, and musical history. For individual instruction a fee is charged.

CLASS INSTRUCTION. Class organization is wholly under the control of the professor of music, and classes are organized at such periods as best accommodate the students interested. There is a growing demand for teachers of music in high schools, and those taking advantage of the courses offered will be well equipped to teach the subject.

## COURSES IN MUSIC

### VOCAL

*First Year.*—The course for this year includes a study of breathing, tone placing, vocal physiology, and simple forms of vocal technique, and the rendition of simple songs and ballads. Text, *Teacher's Exercises*. Concone's *Vocalises*, op. 9-17.

*Second Year.*—The study of vocal technique is extended. Concone's *Vocalises* are continued. Sacred songs and ballads are studied.

*Third and Fourth Years.*—*Vocalises* by Bordese, Lamperti, Marchesi, Nava, Panzeron, Rubini, and songs by Schubert, Brahms, Schumann, and other masters, as well as oratorio and operatic arias, are studied during these years.

### PIANO

*First Year.*—This course includes: studies in the rudiments of music, melody, rhythm, and the underlying principles of touch and technic; etudes by Gurlitt, Streabbog, Burgmuller, Kohler, and Biehl, and simple selections from modern composers.

*Second Year.*—In this course are studied the compositions of Loeschhorn, Czerny, Heller, Lecoupey, Bertini, Duvernoy, and Smith. Preparatory octave studies, a study of scales, and special technical work are also offered.

*Third Year.*—Advanced work in technic and scales; studies by Cramer, Czerny, Field; Bach's little preludes and fugues; two-part inventions; Kullak octave studies; sonatas by Haydn and Mozart; selections from Chaminade, Rubinstein, Grieg, Scharwenka, Godard, Jensen, and Poldini, form the basic matter of this course.

*Fourth Year.*—Advanced work in technic, phrasing, and interpretations; Bach's three-part inventions and well-tempered clavichord; Clementi's *Gradus ad Parnassum*; Foote, MacDowell, and Henselt etudes; Beethoven sonatas; and more difficult selections from classic and modern composers, are studied during this year.

#### VIOLIN

*First Year.*—Particular attention is given to attaining correct position, intonation, and bowing. Methods by Hohmann, Wichtl; etudes by Wohlfahrt; scale studies; easy pieces, are considered in this course.

*Second Year.*—Methods by Wichtl, Dancla, etudes by Wohlfahrt, Kayser's Technical Studies; duets by Pleyel, Mazas, etc.; selections from Dancla, Singelee, De Beriot, and modern composers, are the subjects of study during the second year.

*Third Year.*—Methods by De Beriot, David; technical studies by Schradieck; special studies; Mazas scale studies; etudes by Kreutzer; selections from De Beriot, Alard, and others; orchestral playing, comprise the work in this course.

*Fourth Year.*—Etudes by Kreutzer; Mazas's brilliant studies; scale studies; selections from Mozart, Tartini, Vieuxtemps, Wieniawski, and others; orchestral playing; ensemble classes, comprise the work of this advanced course.

#### ELECTIVE IN MUSIC

In connection with vocal and instrumental music the following subjects are given:

##### JUNIOR YEAR

*Fall Term.*—Theory, including notation of music, pitch, rhythm, measure, symbols, metronome marks, acoustics, chromatic signs, keys, major and minor scales, signatures; harmony, including intervals, triads of the major and minor scales; the history of music, including ancient and oriental music, and the progress of musical development to the close of the sixteenth century, are studied in this course.

*Winter Term.*—Theory, including intervals, chords, ear training, thinking tones, nonchordal tones, embellishments, and abbreviations used in music; harmony, including inversions of triads, dominant sept-chords and inversions; and history of music, treating music in the seventeenth century, opera, oratorio, and instrumental music to the present day, are studied during this term.

*Spring Term.*—Theory, including musical forms, vocal, instrumental, instrumentation and uses of various instruments, modern orchestra, prosody, musical terms in general use; harmony, including collateral sept-chords of the major and minor scales, inversions, cadences; and the history of music, including the biographies of great musicians—Bach, Haydn, Handel, Beethoven, Chopin, Schumann, Liszt, Wagner, Grieg, and others, are treated in this course. Texts: Theory, *Musical Essentials*, by Maryatt; Harmony, text by Brockhoven; History, text by Fillmore.

##### SENIOR YEAR

*Fall Term.*—Two lessons a week in vocal music or in specialized instrument are given. The work in harmony includes a study of chords of ninth, eleventh, etc., and altered chords.

*Winter Term.*—Two lessons a week in vocal or in specialized instrument are given. The work in harmony includes a study of suspensions, analysis, and modulation.

*Spring Term.*—Two lessons a week in vocal music or in specialized instrument are given. The work in harmony includes a study of modulation, and harmonization of melodies.

**MUSICAL ORGANIZATIONS.** Each instrument has a distinct function in the science of tonal expression, and only in the combination of instruments are the finest effects in the coloring of the melody, harmony and rhythm procured. This combination is made possible in the Department of Music by the number of students and by the variety of instruments. Students who are sufficiently advanced to join the College Choral Union, the College Glee Club, the College Orchestra, or the Military Band, may become members by assignment.

*The Orchestra.*—This organization endeavors to maintain a correct and well-balanced instrumentation, and gives the members opportunity for practical orchestral playing. The work is highly educational, including, as it does, the study and performance of standard overtures, symphonies, and concert pieces in classic and modern form. The orchestra furnishes music for the College Assembly each morning and assists in several concerts and entertainments during the year.

*Choral Union.*—Chorus singing is of great importance to students in voice, and this society was organized for their benefit. The students receive here much needed experience in sight reading, become familiar with choral masterpieces, and enjoy the broadening influence of these works. One rehearsal is held each week. Regular attendance is required.

*Assembly Chorus.*—The more advanced students are invited to sing in this chorus, which has for its object the rendition of a weekly choral selection at the assembly. Only the highest class of church music is used on these occasions. Rehearsals are held on Friday afternoons.

*Glee Club.*—The College Glee Club averages about sixteen of the best male voices in the institution.

*Military Band.*—The band is a part of the cadet corps, and practice in the band is accredited, through the Military Department, in lieu of drill and theoretical instruction. Members of the band are required to conform strictly to cadet regulations. Assignments to the band are made for the entire year by the leader. Members of the band are required to attend regularly until after Commencement exercises. The band furnishes music for all ceremonies of a military character and for various other college occasions.

*Annual Concert.*—On Wednesday of Commencement week, an annual concert is given by the Choral Union, assisted by the orchestra. In the spring term a number of musical recitals are given, of which the students furnish the entire programs. These recitals are open to the public.

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## Physical Education

Professor LOWMAN  
Instructor MERNER  
Instructor SELLNER  
Assistant HOLLIDAY  
Assistant HUTTO

The purpose of this department is to assist the students of the College to live to the best advantage, and so to aid them in the formation of hygienic habits that during their College course they may make profitable preparation for life. It is an urgent necessity that every student have an intelligent appreciation of the means requisite for the preservation of his health, in order that he may be able to formulate intelligently his own policy of health control.

All young men and all young women of the College are entitled to the privileges of the gymnasium, which is one of the largest in the West and is well equipped with all sorts of apparatus for physical training, with lockers, plunge baths, shower baths, and other accommodations.

Physical training is optional for men, but may be elected. Three days a week for the term is considered full time, and for this one hour of credit is given. A total of six hours of credit may be elected. All young women below the junior year are required to take physical training, unless excused by the Dean of Women, except that in the sophomore year music may be taken instead; provided that the student has a credit of at least one year of physical training. Women excused from physical training on account of physical disability are provided by their dean with an equivalent or stronger substitute work from the regular course, and their normal work later in the course is increased by that amount. After the two years, required physical training have been completed, women have the privilege of electing physical training for credit under the conditions stated above for the men.

The following phases of departmental work are combined for the purpose of accomplishing the desired end:

## PHYSICAL TRAINING FOR MEN

### PHYSICAL EXAMINATIONS

The work of the department is based largely upon a physical examination given each student upon his first entrance to the College. A second examination is given at the close of his sophomore year. All students, whether taking work in the department or not, are entitled to receive a physical examination, and advice as to their physical condition.

The measurements taken and the tests given have each a definite purpose with reference to ascertaining the muscular condition of the individual. A diagnosis is also made of the vital organs to ascertain their functional conditions, and a complete inspection of the whole body is made to detect any weakness or deformity that may exist. Based upon the information thus obtained, advice is given and work is assigned to students in accordance with their physical needs and tastes, and their condition of fitness. Delicate students, and those suffering from functional disorders, receive individual attention. Students organically sound are assigned work in a carefully graded and progressive system of gymnastics and athletics. All candidates for athletic teams, class as well as College teams, are required to enroll in the department, submit to a thorough physical examination, and pass the grade tests before being allowed to compete for positions on the various teams. Students engaging in two or more College sports during the school year must undergo a physical examination before undertaking any given sport. This is required in order that no student may indulge in athletics to his own permanent physical injury. Each student may secure a copy of his own physical measurements, and an anthropometric chart, showing in graphic form his own development as compared with the average or typical man.

Members of the College teams, reporting regularly, are excused from regular class work, and are entitled to full credit in that portion of their work; but before the completion of the course, at least two terms' work must be done in the gymnasium. Credit, the equivalent of a one-hour subject, is given and counts toward the College degree. The individual's grade rests largely on the basis of attendance, punctuality, earnestness, and application; but written and practical tests are also given.

Regulation uniforms must be worn in the gymnasium. Students are advised not to procure uniforms until after their arrival at the College.

A student who is a regular member of one or more of the College athletic teams, if due to take military drill, may be transferred to physical education for the season of the sport in which he participates, but no man may take part in more than two sports, of one term each, in one year. At the end of the season the man is reported back to the Department of Military Training for the remainder of the term, and a grade reported to the Registrar by the Professor of Physical Education for the student's work in that department, stating the time devoted to it; and a grade in military drill is reported by the Professor of Military Training for the student's work in military drill, stating the time given to that subject.

Men due to take military drill are permitted to try for the freshman athletic teams, and, if chosen for such teams, may be transferred from military training to physical education, as are regular members of the College athletic teams. Grades in the two subjects are also to be reported in a similar manner.

Men in the College teams, in the freshman athletic teams, or on trial for these teams, must report regularly for athletic work, and any who fail in this respect are returned to the Department of Military Training at once.

All requests for transfer from military to athletic work must come directly from the Professor of Physical Education, and as soon as the transfer is definitely decided upon, the Registrar and the dean are notified in order that a proper record of the change in assignment may be made.

Students who are due to take military drill but who expect to be on athletic teams for one or more sports, must be measured for military uniforms and order uniforms at the beginning of the term in order that they may be ready for use at once when the students are reported back to the Department of Military Training.

#### HYGIENIC INSTRUCTION

This instruction gives an insight into the practical problems of daily healthful living from a personal point of view. Directions are given for avoiding the common ills of student life, and for maintaining the highest physical and mental condition while in college, as well as for gaining the highest development of vital power and health for future duties.

1.—FRESHMAN COURSE. Sixteen lectures. These lectures give special attention to exercise, rest, food, respiration, care of excretions, clothing, and bathing and cleanliness. The effects of certain abnormal bodily conditions and habits are also given due consideration; *e. g.*, adenoids, large tonsils, decayed teeth, mouth breathing, rapid eating, the use of narcotics and stimulants, constipation, and certain phases of social hygiene. Training principles for athletic contests and athletic equipment also receive attention.

2.—SOPHOMORE COURSE. Twelve lectures. This course reviews and enlarges upon certain phases of the freshman course; deals with bacteria and a few other common causes of disease, their distribution and transmission; includes a discussion of the "common carriers" of disease, such as food, water, clothing, flies, mosquitoes, other insects, animals, and careless human beings; discusses the defenses against disease, such as established boards of health and quarantine, and appropriate sanitary

legislation. The defenses of the individual, such as cleanliness, avoidance of the carriers of disease, the use of antiseptics, sunshine, fresh air, and immunity are further discussed.

#### INSTRUCTION IN PHYSICAL EXERCISE

This course furnishes instruction in all the various grades of gymnastic and athletic exercises offered by the department. The great variety of exercises offered is intended to meet all individual needs, capacities and tastes. A physical examination and test determines the grade or class of exercises for which a student is fitted.

A.—GYMNASTICS. During the winter term the work is conducted indoors, and consists of light and heavy gymnastics, which are selected with a view to obtaining progressive effect upon the bodily organism:

a. *Free Calisthenics*. Exercises are selected for their different effects upon the bodily organism, and are arranged in the order of increasing difficulty. They involve hygienic or body-building work, educative movement, and corrective or remedial exercises. Both the Swedish and the German systems are used.

b. *Tactics*. A modified form of the military and of the German system is used, both for convenience in handling classes and for disciplinary value.

c. *Light Apparatus*. Training is given in the use of Indian clubs, dumb-bells, wands, bar bells, etc.

d. *Heavy Apparatus*. Graded exercises are given on parrallel bars, vaulting bars, bounce board and mat, side and long horse, high and low horizontal bars, traveling and flying rings, etc.

e. *Indoor Athletics*. Instruction is given in all indoor track events preparatory to indoor track meets.

f. *Games*. There are included basketball, indoor baseball, volley ball; also, other games of a more recreative nature.

g. *Specials*. Under this head come fencing, boxing, wrestling, tumbling, and advanced apparatus work, offered as advanced work to those who have had not less than two terms' work in the gymnasium. Hours are arranged with the instructor.

h. *Swimming*. A part of the regular instruction for the spring term is in swimming. A passing grade must be made in this phase of the work.

B.—DEPARTMENTAL ATHLETICS. In the fall and spring terms, the courses in the gymnasium are partly supplemented by instruction in outdoor athletics. Individuals are assigned to the kind of work best suited to them. Attendance is compulsory upon those participating. In the fall the following sports are offered: football; track and field events; cross-country running; and outdoor basketball. In the spring are offered: baseball; track and field events; cross-country running; and outdoor basketball.

Cross-country running is encouraged throughout the year. Natural exercise in the open air takes precedence of all other forms of exercise. Opportunity is offered for tennis, but it can not be elected in place of required work.

Days unsuited for outdoor work are devoted to a discussion of playing rules, the principles of training for athletic contests, and lectures on team work.

C.—INTERCOLLEGIATE ATHLETICS. These contests are promoted and encouraged for the more vigorous students, because of their effect upon college life, and their wide social and moral value to the participants. Intercollegiate teams should represent the final stage of selection in an

educational process and development among a large number of students, thereby giving both a rational physical education system and a healthy system of sport. Intercollegiate contests are scheduled for the different sports; viz., football, basketball, baseball, track athletics, and tennis.

## PHYSICAL TRAINING FOR WOMEN

### PHYSICAL EXAMINATIONS

A physical examination of each young woman is made by the instructor in charge of women before permission to enter a class is given. This includes an elaborate system of body measurements and an examination of the condition of the heart and lungs. Physical defects, abnormalities, and weaknesses are noted and judicious, healthful exercise is prescribed to fit the student's individual needs.

A suit has been adopted which consists of black serge blouse and bloomers, and must be made in uniform style. The pattern for the suit is the *Ladies' Home Journal* pattern number 5421.

### INSTRUCTION IN PHYSICAL EXERCISE

1.—PHYSICAL TRAINING I. Freshman year, each term. Four hours. Required of all young women.

Health talks are given. Correction of improper standing and walking, marching, free exercises, folk dancing, elementary series in wands, dumb-bells, Indian clubs, balance ladder, song plays, and games, are treated in this course.

2.—PHYSICAL TRAINING II. Freshman year, each term. Four hours. Required of all young women. Prerequisite: Physical Training I.

In this course military marching, fancy steps, continuation of work with light apparatus, stall bars, flying rings, giant stride, work with chest weights, games and basketball are included.

3.—PHYSICAL TRAINING III. Freshman and sophomore years, each term. Four hours. One term required of all young women; three subsequent terms, optional with music, required of all sophomore young women.

Fancy marching, esthetic dancing, advanced free exercises, coördination of work with Indian clubs, wands, and dumb-bells, jumping horse and parallel bars are here included, along with folk dances and song plays, tennis, and indoor baseball. Prerequisite: Physical Training II.

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## Physics

Professor HAMILTON  
Instructor JENNESS  
Instructor FLOYD  
Assistant RABURN  
Assistant ALLEE  
Assistant PIPER

Recognizing the need of a thorough knowledge of the fundamental laws and principles involved in all physical changes, provision has been made, in the courses which follow, for both a theoretical and a practical treatment of the subject. Instruction is based upon the facts given in selected textbooks, and these topics are enlarged upon by lectures and illustrated by experimental demonstrations. The purpose is to give a training in

exact reasoning, and a knowledge of principles that will be factors in the solution of problems in all branches of science as well as in everyday life.

The laboratory work which accompanies the courses in physics gives a student abundant opportunity to test the principal laws of the science; and, since he is expected to arrange and operate the apparatus, the work should enable him to acquire skill in manipulation, precision of judgment, and care in the use of delicate instruments. The laboratories are well arranged for the work, and the equipment provided is of a nature adapted to meet the requirement of accurate work in all courses. The manual in use in most of the courses is one prepared by the department to meet the exact conditions and equipment of the laboratory.

### COURSES IN PHYSICS

1.—HOUSEHOLD PHYSICS. Fall, winter, and spring terms. Class work, four hours. Four credits.

A course of lectures and demonstrations, in which the laws relating to principles involved in appliances of the household are explained and illustrated. The work in heat is based upon thermometry, calorimetry, radiation, absorption, and methods of refrigeration and ventilation. The course includes a study of light, with its color phenomena and actinic effects; of some of the optical instruments used in scientific work; a study of electric lighting and illumination, and of cost of operating many of the appliances used in the home, including suggestions for the proper use and care of electrical apparatus for the protection of the appliance and of the operator.

2.—GENERAL PHYSICS I. Fall term. Class work, three hours; laboratory, two hours. Four credits. Prerequisite: Plane Trigonometry.

This course, like the one following, is provided for those intending to specialize in scientific lines. It covers, in as thorough a manner as possible, the general principles involved in mechanics and sound. Text, Reed and Guthe's *College Physics*.

*Laboratory.*—The work is based upon laws and principles discussed in the classroom, and is so arranged that the students may have a practical illustration of the facts learned.

3.—GENERAL PHYSICS II. Winter term. Class work, three hours; laboratory, two hours. Four credits. Prerequisite: General Physics I.

This course includes a study of the theory of electricity. The class follows the subject as outlined in the text, but special emphasis is placed upon those parts that have an immediate bearing on the work of other sciences, such as electrolysis, thermal effects, relation of electrical and mechanical energy. Text, Reed and Guthe's *College Physics*.

*Laboratory.*—The work follows the subjects presented in the class, and is conducted with a grade of apparatus that gives training in the use of the better class of instruments employed in scientific investigations.

4.—GENERAL PHYSICS III. Spring term. Class work, three hours; laboratory, two hours. Four credits. Prerequisite: General Physics II.

The work offered in this course includes the theory of heat and light. A study of the various effects of heat and the units employed in heat measurements. The work in light discusses not only the effects of light, but the methods used in measuring light intensities and the ways in which light may be used in physical measurements. Text, Reed and Guthe's *College Physics*.

*Laboratory.*—The laboratory work consists of measurements in calorimetry, photometry, spectrum analysis, and light waves.



5.—ENGINEERING PHYSICS I. Fall and winter terms. Class work, four hours; laboratory, two hours. Five credits. Prerequisite: Trigonometry.

This course in mechanics is intended to give the engineering students as thorough a working knowledge as possible of the fundamental units and laws involved in force, work, power, and energy; also the laws of simple machines, gases, and liquids as they occur in the transformation of force and energy. Text, Spinney's *A Textbook of Physics*.

*Laboratory.*—The work consists of the use of apparatus to test the laws of inertia, moments of force, moments of torsion, elasticity, and rigidity, and other laws and principles involved in mechanics. Accurate measurements and carefully recorded data are required.

6.—ENGINEERING PHYSICS II. Winter and spring terms. Class work, four hours; laboratory, two hours. Five credits. Prerequisite: Engineering Physics I.

This course treats of electricity and light. The work in electricity is of such a nature as to give the student a working knowledge of the units employed, and of the fundamental laws; and to acquaint him with methods of producing a current, its uses, and the system by which electrical energy is measured. The principal phenomena of light, together with the laws that may have a direct bearing upon light as a standard and method of measurement, are treated in this course. Text, Spinney's *A Textbook of Physics*.

*Laboratory.*—The electrical work in this course includes measurements of resistances, a study of primary cells, and the transformation of mechanical into electrical energy. The work of light consists of a study of the laws of reflection and refraction, and measurements of wave lengths by means of the spectroscope, the use of the interferometer, and photometry.

7.—ENGINEERING PHYSICS III. Fall and spring terms. Class work, four hours; laboratory, four hours. Six credits. Prerequisite: Engineering Physics II.

Heat is treated both theoretically and practically, and in such a manner that its relation to mechanical energy is emphasized. The methods of measuring heat energy and the methods of heat transformation and transference are discussed and illustrated. The facts in sound that involve points of special use and training are discussed. Text, Spinney's *A Textbook of Physics*.

*Laboratory.*—This course consists of measurements of velocity of sound in solids and gases, thermometry, calorimetry, expansion of solids, liquids, and gases, and the mechanical equivalent of heat.

8.—AGRICULTURAL PHYSICS. Spring term. Class work, four hours. Four credits.

This course includes a series of lectures and class demonstrations based upon heat, light and electricity as involved in influencing farm life. The elementary factors of weather and weather forecasting are explained, and access given to the weather records and apparatus of the College weather station. The work in light emphasizes the value of light in plant growth, in spectrum analysis, and in many of the natural phenomena. Electricity is presented in such a manner that the student may gain a working knowledge of the various electrical appliances that can be used on the farm.

9.—ACOUSTICS. Fall term. Class work, two hours. Two credits.

In this course a special study is made of the acoustic properties of buildings, of the architectural defects which give rise to poor acoustics, with a study of special methods used to avoid such troubles in construction of buildings or to correct them in constructed buildings.

10.—RADIANT ENERGY. Fall term. Class work, three hours; laboratory, two hours. Four credits. Elective.

This course and the two courses following are arranged with the special purpose of giving a training which will be of value to those who may intend to teach physics, chemistry, or mathematics, or to those expecting to do advanced scientific work. The various forms of radiant energy are discussed: spectra and spectrum analysis, polarized light, radioactivity, electric and magnetic waves, absorption and dispersion and their phenomena.

*Laboratory.*—The work is based upon the theory developed in the class work, and includes the use of the spectrometer, polariscope, interferometer, optical bench, of photometry, etc.

11.—PHYSICAL MEASUREMENTS. Winter term. Class work, two hours; laboratory, four hours. Four credits. Elective.

The class work is based upon principles that are involved in instruments for accurate measurements. The instruments described and used are typical ones employed in measurements of mechanical forces, heat, and electricity. Part of the class work is the development of formulas.

*Laboratory.*—The work is so selected as to give the widest possible range in the variety of instruments used and of principles illustrated.

12.—PHYSICAL MANIPULATIONS. Spring term. Class work, two hours; laboratory, four hours. Four credits. Elective.

Class periods are utilized for outlining and discussing the selection and arrangement of apparatus for demonstrational work.

*Laboratory.*—The work consists of glass blowing, bending and grinding; silvering, photography, electroplating, and the making of pieces of apparatus for special demonstrations. In this course opportunity is given those intending to teach to become thoroughly acquainted with modern laboratories and laboratory methods.

13.—PHOTOGRAPHY. Fall or spring term. Class work, two hours; laboratory, two hours. Three credits. Elective. Prerequisite: training in physics and chemistry.

The importance of a record of exact details, as shown in a photograph, makes this work valuable to all scientists. The course gives the student some knowledge of the chemical and physical principles involved in the art, as well as practice in making good negatives and prints. The lecture and laboratory work deals with: things to be considered in selecting a camera; proper exposures; composition of pictures; proper development of plates; tests of different developers; retouching; reducing and intensifying negatives; printing and mounting; making lantern slides, bromide enlargement, and the prints best adapted for illustrated articles in newspapers and magazines.

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## Public Speaking

Assistant Professor JOHNSTON, in Charge  
Assistant BEACH

It is the constant effort of the Department of Public Speaking to correlate the training in public speaking with the work in all the other departments of the College; to harmonize it with the spirit of the school, which is distinctly technical and industrial. With this end in view, students in agriculture are trained in the presentation and discussion of agricultural facts before supposed audiences of farmers. Students in engineering, architecture, etc., are trained in speaking on subject matter relating to their respective courses of study, and to their probable needs and activities in later life. Conviction, not entertainment, is the dominant purpose in every case.

## COURSES IN PUBLIC SPEAKING

1.—PUBLIC SPEAKING. Freshman year, fall, winter, or spring term. Four hours a week. Four credits. Required in the courses in general science and industrial journalism.

This course begins with a study of the fundamental principles and accepted rules of public address. These are applied in the interpretation of selected masterpieces of general literature and oratory, and also in the delivery of original subject matter by each student, the class serving as his audience and critics. Some time is devoted to exercises in correct breathing, articulation, and tone production, and to fit these to the individual needs of students. Instruction is given by recitation, lectures, and platform work. Text, Kammeyer's *Principles and Practice of Public Speaking*.

2.—EXTEMPORE SPEECH. Freshman year, spring and fall terms. Two hours a week. Two credits. Required in the courses in the Division of Mechanic Arts.

This course is an abbreviation of Public Speaking and is limited to students in the Division of Mechanic Arts. It is not an equivalent of Public Speaking and may not be substituted for it. Instruction is given by means of lectures and platform work.

3.—TECHNIQUE OF SPEECH. Junior or senior year, winter term. Two hours a week. Two credits. Elective in the course in general science. Prerequisite: Public Speaking or Extempore Speech.

The specific purpose of this course is to offer more extended drill and practice in vocal and physical expression than can be given in the others as outlined. Practically all the time is devoted to exercises for the correction of faulty articulation, grouping, bearing, attitude, gesture, etc. Reading and impromptu speaking before the class afford opportunity for testing and ability acquired. The dominant purpose of the course is to help students to fix correct habits of speech by means of frequent repetitions and conscious effort. Instruction is given by means of drill and platform work.

4.—FORMS OF PUBLIC ADDRESS. Junior or senior year, spring term. Four hours per week. Four credits. Elective in the course in general science. Prerequisite: Public Speaking or Extempore Speech.

A special study of types of utterances and forms of public address is made. Great orations of ancient and modern times are studied in their historical settings, analyzed, and interpreted. Original platform work continues throughout the term, and consists of after-dinner speeches, memorial addresses, debates, and other forms of public address for formal occasions. Instruction is given by means of assigned readings, lectures, and platform work.

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Sociology.

Professor HOLTON  
Assistant Professor REISNER

It is recognized by all students of the development of civilization that a knowledge of the fundamental laws controlling social groups is essential in the education of those who will largely determine the character of our rural and urban institutions. The controlling motive in the courses in sociology is the need of efficiency in our social institutions.

## COURSES IN SOCIOLOGY

1.—PRINCIPLES OF SOCIOLOGY. Senior year, fall term. Class work, four hours. Four credits. Required in the courses in agriculture and industrial journalism; elective in other courses.

This course attempts to make a systematic survey of social processes from the view point of developing fundamental principles and laws of social control. The work is given by means of textbook, lectures, and reports.

2.—SOCIAL PSYCHOLOGY. Senior year, winter term. Class work, four hours. Four credits. Elective. Prerequisites: Psychology; Principles of Sociology.

This course is a study of the group-mind and its influences upon the individual mind. It attempts to show the influence of traditions, customs, conventionalities, etc., upon present-day social institutions and individual habits. Text, *Social Psychology*, by McDougall.

3.—RURAL SOCIOLOGY. Senior year, spring term. Class work, four hours. Four credits. Optional in the course in agriculture; elective in other courses.

This is a course in the elements of sociology applied to rural traditions, customs, and institutions. An outline of the course is as follows: Old World peasantry; the making of peasantry; prevention; the trend of rural population; the composition of rural population; rural social institutions; the rural church; the rural school; farmers' organizations; vital statistics; moral level; delinquency and dependence; insanity; the position and work of women; farm labor; rural politics; cultural ideals; standards of business; the psychology of rural life; class consciousness.

4.—COMMUNITY SURVEYS. Senior and graduate students, fall, winter, or spring term. One double period a week. The number of credits depends upon the time given to investigation and the quality of the work. Elective.

This course is a study of the methods of investigation and plans of work employed by social-service institutions, such as endowed foundations and bureaus of municipal research. Each student works out plans for, and makes a survey of, the health, social, economic and educational conditions in a given community.

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## Zoology

Professor NABOURS  
Assistant Professor ACKERT  
Instructor HARMAN  
Assistant YOCUM

Classroom teaching and laboratory instruction are closely correlated, and the student is expected to be able to draw conclusions based upon a comparison of information from both sources. As nearly as circumstances permit, the classroom and laboratory work on the same form proceed simultaneously. By means of frequent and carefully planned excursions and the free use of vivaria in the laboratory and museum, the student is never allowed to forget that he is dealing with living creatures, in many cases fellow members of his own environment, some of which are decidedly beneficial or decidedly injurious to his welfare. The courses offered by this department are intended to awaken in the student an appreciation of the general principles of animal life and of its relation to the welfare of man.

A large number of standard anatomical charts, and representative collections of vertebrates and invertebrates, a series of lantern slides, and a series of microscope mounts are available for illustrative purposes. Compound and dissecting microscopes sufficient for the needs of laboratory classes have been provided.

### COURSES IN ZOOLOGY

1 to 3.—GENERAL ZOÖLOGY I, II, AND EMBRYOLOGY. Sophomore year for students in agriculture and home economics. Freshman year for students in general science, industrial journalism, and veterinary medicine. Required of all students in these courses. Fall, winter, and spring, or winter, spring, and fall terms, respectively. Class work, two hours; laboratory, four hours. Four credits each term. Men and women are taught in separate sections. The students are grouped in sections according to the amount of their experience, and the nature of the work is varied to suit the needs of each group.

Course 1 represents a connected elementary study of the structure and functions of types selected to illustrate the development of the invertebrate part of the animal kingdom. Attention is given to classification and the relations of the different forms.

Course 2 consists of a connected elementary study of the structure and functions of types selected to illustrate the development and relations of the vertebrate parts of the animal kingdom. Some attention is given to classification, but the work mainly consists of a study of the organs and their functions of a few selected types.

Course 3 (Embryology) represents a study of the development of the germ cells, fertilization, and the nutrition and growth of the vertebrate embryo, with a greater emphasis on the comparative study of the development and nutrition of the foetuses of the domestic mammals and man. This course aims to give a general idea of embryological development and a better understanding of the organs and their functions of the types in the phylum Chordata.

*Laboratory.*—The laboratory work in courses 1 and 2 consists of observations of the form and activities of living animals, both in the field and in the vivaria in the laboratory and museum, and of the dissection and sketching of the important systems of those animals selected as types. The laboratory work in embryology represents a microscopic study of the male and female germ cells, stages in the process of fertilization, the segmenting ovum, and the serial sections and whole mounts of the chick and pig embryos in several stages of development. Considerable attention is given to the dissection and study of the relations of the foetus to the uterus of the mother in the cat, the pig, the cow, and man.

4 to 6. ADVANCED ZOÖLOGY I, II, and III. Junior or senior year, fall, winter, and spring terms, respectively. Class work, two hours; laboratory, four hours. Four credits each term. Elective in the courses of general science, agriculture, and home economics. Prerequisites: General Zoölogy I, II, and Embryology, or equivalent.

Course 4 represents a fundamental study of the structure and functions of invertebrate types. Course 5 begins the same sort of study of chordate types. Relationships are considered from the point of view of embryology and paleontology, as well as that of comparative anatomy. Course 6 is a continuation of the preceding.

*Laboratory.*—The laboratory work consists of the dissection and sketching of the systems of selected types and of such experiments in fundamental physiology as the time and apparatus permit.

7.—ADVANCED MAMMALIAN EMBRYOLOGY. Senior year, winter term. Elective in the courses in general science and agriculture. Prerequisite: General Zoölogy I and II, and Embryology, or equivalent. Lecture and class work, three hours. Three credits.

This course consists of a review and further study of the main facts of embryology, with a more particular comparative study of the physiology of reproduction in the domesticated mammals and man.

8.—GENERAL ZOÖLOGY TECHNIQUE. Junior or senior year, spring term. One lecture and six hours of laboratory a week. Four credits. Elective in the courses of general science, agriculture, and home economics.

This course is designed especially for those expecting to continue work along biological lines. The students become acquainted with methods of collecting, killing, and preserving, and with the preparation for study of various sorts of zoölogical material, both gross and microscopic. It includes the making of whole mounts and the general methods of imbedding, sectioning and staining microscopic material for microscopic slides. The lectures explain further the theory and practice of useful methods of technique. Prerequisites: Zoölogy I and II.

9.—PARASITOLOGY. Senior year, winter term. Class work, two hours; laboratory, two hours. Three credits. Required in the course in veterinary medicine; elective in the courses in general science, agriculture, and home economics. Prerequisites: General Zoölogy I and II, or the equivalent.

This course includes a study of the chief characteristics, life histories, economic importance of the serious external and internal parasites of domestic animals and man.

*Laboratory.*—The laboratory work is a study of the structural and functional adaptations characteristic of a parasitic existence.

10.—EVOLUTION OF DOMESTIC ANIMALS. Senior year, winter term. Class work, two hours. One credit. Elective in the courses in general science, agriculture, and domestic science.

This course consists of lectures and readings on general evolution, with special reference to the domestic animals. The geological history, so far as it is known, and some phases in the domestication of our common farm animals are given careful attention. Each student works out completely the geological and later history of some specially assigned animal.

11.—ECONOMIC ZOÖLOGY. Spring term, sophomore, junior, or senior year. Lectures, two hours; laboratory, four hours. Four credits. Elective in the courses in home economics, agriculture, and general science.

This course consists of a study of the different phyla of animals and their dependence on one another, and special studies of birds and mammals. The publications of the experiment stations and the Department of Agriculture and the specimens in the museum are used extensively, both in the class and in connection with the field work.

*Laboratory.*—The laboratory work consists largely of four-hour field trips to a number of specially selected areas, ponds, streams, meadows, woods, and college farm. Much of the time of the trips is taken in the identification of birds and mammals, with special attention given to their adaptation and economic importance.

12.—ZOÖLOGICAL SEMINAR. For the staffs in entomology and zoölogy and advanced students in these departments. No credit. One two-hour session a week. Fall, winter, and spring terms, respectively.

This course consists of the presentation of papers on original investigations by members of the two departments and advanced students. Here the papers to be read at scientific meetings or published in scientific

journals or bulletins are discussed. Most of the sessions are devoted to the presentation and criticism of the best thoughts on the fundamental problems of biology found in the books and periodicals in the library or reported by members from scientific meetings.

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### **Special Courses for Teachers**

At the present time the teaching of vocational subjects in the public schools is undergoing great development. Many schools are introducing manual training, agriculture, domestic science, and domestic art, and many others are extending the work hitherto given. The State law requiring the teaching of agriculture in the rural schools is also creating a strong movement in the same direction. There is an active demand for teachers who can handle such work successfully.

The College offers to graduates of other institutions, and indeed to all who have studied such subjects as may be prerequisite, unexcelled facilities for securing training in the industrial subjects indicated. Courses extending over one or two years may be arranged by means of which the student who is already prepared in English, mathematics, and to a certain extent in the sciences, may prepare himself to enter a broader and, frequently, a more remunerative field.

Page 225, Nos. 15, 16, 17, 19, 20, and 21, exhibit groupings that illustrate the possibilities in work of this character, and other arrangements may be made. Those taking such courses will be cared for in the regular classes provided for other students, and no limitation is imposed except that the prerequisites for any subject must have been taken previously, here or elsewhere. These prerequisites are stated in this catalogue in connection with the description of each subject. The catalogue also shows the terms in which a subject is regularly given, but many of those of the freshman and of the sophomore year are also offered at other times. Prospective students may receive information concerning such other opportunities by addressing the President of the College.

## **The Summer School**

EDWIN LEE HOLTON, Director

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There is no larger or better equipped plant devoted to the teaching of agriculture, home economics, mechanic arts, and related subjects than Kansas has in her State Agricultural College. In order that this plant may not remain idle during the summer, the Board of Administration has authorized the organization of a Summer School for Teachers. The College is authorized by an act of Congress to expend each year a portion of the national appropriation for "providing sources for the special preparation of instructors for teaching the elements of agriculture and mechanic arts."

Each year there is an increasing demand for trained teachers of agriculture, shop work, and home economics. The College has not been able to supply this demand. The Summer School offers an opportunity for experienced teachers to prepare themselves to meet the new demands placed upon the public schools; viz., preparing the boys and girls for vocational and social efficiency.

### ADVANTAGES AT THE KANSAS STATE AGRICULTURAL COLLEGE

For the training of teachers in vocational subjects the Kansas State Agricultural College has a peculiar advantage. The College campus occupies a commanding and attractive site upon an elevation adjoining the western limits of the city of Manhattan, with electric car service into town and to the railway stations. The grounds are tastefully laid out according to the designs of a landscape architect, and are extensively planted with a great variety of beautiful and interesting trees, arranged in picturesque groups, masses and border plantings, varied by banks of shrubbery and interspersed with extensive lawns, gardens and experimental fields. Broad, macadamized and well-shaded avenues lead to all parts of the campus. Including the campus of 160 acres, the College owns 748 acres of land. Outside the campus proper, all the land is devoted to practical and experimental work in agriculture. Within the College grounds most of the space not occupied by buildings or needed for drives and ornamental planting is devoted to orchards, forest and fruit nurseries, vineyards, and gardens.

The College buildings, twenty-one in number, are harmoniously grouped, and are uniformly constructed of attractive white limestone obtained from the College quarries. The College owns and operates its own system of waterworks, and is provided with a complete sewerage system.



There is a growing conviction among the leading educators that the best institution in which to train teachers of vocational subjects is a well-equipped technical college, where the courses of study are pointed towards the producing vocations. The Kansas State Agricultural College is such an institution.

#### EXPENSES

Tuition is free. An incidental fee of \$3 and a medical fee of 50 cents a term are charged all students whose homes are in Kansas. For nonresidents of the state a matriculation fee of \$10 upon entrance and an incidental fee of \$10 and a medical fee of 50 cents a term are charged. Receipts for these fees must be presented before enrollment in the College classes. Table board varies from \$3.50 to \$4 a week. Room rent ranges from \$8 to \$12 a month. The College Young Men's Christian Association offers accommodations in its building for a limited number of students, at prices from \$10 to \$12 per month. The cost of rooms is reduced by half where two students room together.

#### COLLEGE CREDITS

Full College credit is given for all courses satisfactorily completed by regularly matriculated students unless otherwise specified in the announcement of the courses. Students desiring College credit are not allowed to carry more than ten credit hours; provided, that an exceptionally able student may be permitted to carry two additional credit hours upon the approval of the Director of the Summer School.

#### REQUIREMENT FOR ADMISSION

Four years of high-school work are required for admission to the College, but any applicant holding a teacher's certificate will be admitted to the courses for the Summer School without examination.

The following classes of applicants will be admitted:

1. Students already enrolled in the College.
2. Graduates of high schools that have four-year courses of study.
3. Any persons holding certificates to teach in the state of Kansas.
4. Prospective teachers who are not graduates of four-year high schools and who do not hold teachers' certificates may be admitted as special students.

#### CONVOCATION

The hours from ten to eleven on Thursday morning are reserved for general assembly of all students. A special address and music are arranged for each of these general assembly periods.

## LIBRARY

The Library is open during the summer. The Librarian places all the valuable books, bulletins and reports at the service of the Summer School students.

## EDUCATIONAL TRIPS

Trips are arranged, for those who desire to take them, to the experimental grounds on the College farm and campus, to study the work in progress. These trips are under the leadership of trained men.

## SCHOOL FOR RURAL LEADERS

From July 14 to 24, 1914, there will be held the Fifth Annual School for Rural Leaders. The College is planning to make this a short course in rural economics and social problems for the pastors, Sunday-school superintendents, teachers and members of other organizations interested in revitalizing rural and village neighborhood life. Some of the best men in the country will lead the discussions.

There will be regular lectures and recitations each day in agriculture, rural sociology, economics, and modern methods of community building.

During the afternoons the College will plan for demonstrations in stock judging, grain judging, trips to the experimental plots, demonstration fields, gardens and orchards.

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## Courses in the Summer School

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### Division of Agriculture

W. M. JARDINE, Dean

#### AGRONOMY

Professor CALL  
Assistant Professor SALMON  
Assistant BLEDSOE

**CEREAL CROP PRODUCTION.** Class work, six hours; laboratory work, four hours. Four credits. Required of all students in agricultural courses; elective in the course in general science.

This course is a study of cereal crops, largely from a production viewpoint. The crops considered are corn, wheat, oats, barley, rye, rice, buckwheat, and grain sorghum. The origin, the history of development, and the factors influencing growth are studied. Facts designating the best place in a rotation of crops are presented. Proper seed-bed preparation, cultural methods, and factors which tend to maximum production receive highest consideration.

*Laboratory.*—In the laboratory a study of the physical characters of each of the cereal crops is made.

**SOIL MANAGEMENT.** Class work, three hours; laboratory work, four hours. Two credits.

This course comprises a study of the management of farm soils, and deals with: the origin of soils and their physical nature; the effect of different methods of cultivation upon the liberation of plant food; consumption of moisture, and physical condition of the soil; the effect of different crops and different systems of farming upon the depletion and conservation of soil fertility; the use of barnyard manure, including proper methods of handling, preserving and applying.

*Laboratory.*—The laboratory exercises supplement the class work in demonstrating the principles of soil management, as outlined in the class.

**ELEMENTARY AGRICULTURE.** Class work, seven and one-half hours.

This course is planned primarily for teachers in the rural and village schools. The subject matter is selected and the work presented with this end in view. The course covers a year's work in elementary agriculture for the rural and village schools. All laboratory work will be presented in such a way that it can be adapted to the needs of the individual teachers. This course is especially adapted to prepare the teachers to meet the requirements of an act of the legislature, which requires teachers to take an examination in the Elements of Agriculture.

## ANIMAL HUSBANDRY

Instructor VESTAL  
Instructor BLIZZARD

**LIVE STOCK I.** Class work, two hours; laboratory, eight hours. Three credits. Required in the course in agriculture; elective in the courses in general science and industrial journalism.

This course consists of a study of the market types and classes of hogs and horses.

*Laboratory.*—Practice in judging.

**LIVE STOCK II.** Class work, two hours; laboratory, eight hours. Three credits. Required in the course in agriculture; elective in the courses in general science and industrial journalism.

This course comprises a study of the market types of sheep and cattle, including both the feeder and the fat classes. The different grades and classes of wool also receive careful attention.

*Laboratory.*—Practice in judging.

**PRINCIPLES OF FEEDING.** Class work, seven and one-half hours. Four credits. Prerequisite: Agricultural Chemistry.

This course involves a study of the digestive system and processes of nutrition, and the theory of practical economy of rations, both for the maintenance and for the fattening of all classes of farm animals.

## DAIRYING

Professor REED  
Assistant GILBERT

**DAIRYING.** Class work, four hours; laboratory, eight hours. Four credits.

A general course in dairying, dealing with the secretion, composition and properties of milk; care of milk and cream on the farm, a study of the different methods of creaming; construction and operation of farm separators; principles and application of the Babcock test; use of the lactometer; and butter making on the farm. Lectures supplemented by textbook.

*Laboratory.*—Practice in operating the Babcock test and lactometer; separation of milk and farm butter making.

LIVE STOCK III. Laboratory, eight hours. Two credits.

Judging dairy stock from the standpoint of economical production and breed type. Score cards are used to teach the student to become accurate, thorough and systematic in the selection of animals as representatives of breeds, or for feeding purposes.

## HORTICULTURE

Professor DICKENS  
Associate Professor AHEARN

PLANT PROPAGATION. Class work, six hours; laboratory, eight hours. Five credits. Prerequisite: Plant Anatomy.

A discussion of the natural and cultural methods of propagation; seeds, seed testing, and seed growing; treatment given to different classes of seeds; the production of seedlings for stock; grafting, budding, layering, making cuttings, and the special requirements necessary in propagating commercial fruits and ornamental plants. Lectures and assigned readings.

*Laboratory.*—Practical work in the preparation of seeds, seed testing, the preparation of seed beds, the use of seeding machinery, transplanting, grafting, budding and general nursery practice.

LANDSCAPE GARDENING. Class work, four hours. Two credits.

Lectures on the principles of landscape art and the means of their application to the problems of improving lawns, yards, country homes, school grounds, and larger plantations; and an acquaintance with species used for obtaining results.

ORCHARDING. Class work, six hours. Three credits. Prerequisites: Plant Propagation and Pomology II.

A discussion of the conditions necessary for success with orchards. Location, improvement of soil, application of fertilizers, pruning, prevention of loss from frost, marketing and storage.

MARKET GARDENING. Class work, four hours; laboratory, four hours. Three credits.

This course comprises a study of the problems and possibilities of the market garden, the necessary equipment, and soil requirements therefor; the value and cost of fertilizers. Text, Bailey's Principles of Vegetable Gardening.

*Laboratory.*—The laboratory work consists of the preparation of plans for the gardens; seed testing; the construction of the hotbed; the use of tools and machines; observations on the growth of crops; management of hotbeds and force houses.

SCHOOL GARDENING. Class work, four hours; laboratory, four hours. Three credits.

This course will be offered if there is a demand for it.

## POULTRY

Professor LIPPINCOTT

POULTRY I. Lectures, four hours. Two credits.

This is a general course dealing with the value and importance of the industry and the management of poultry on the farm.

## **Division of Mechanic Arts**

A. A. POTTER, Acting Dean

### **DRAWING AND ART**

Miss HOLMAN

**PUBLIC SCHOOL DRAWING.** Laboratory course, eight hours.

This course presents free-hand and object drawing and some water-color and crayon work for rural and grade schools. The state text in drawing is used and the course is especially designed to be helpful to teachers in using these books.

**COLOR AND DESIGN I.** Laboratory course, eight hours.

This course consists of a study of color combinations based on spectral color. It includes the development of problems illustrating changes of hue and value. The principles of design are also developed by problems and closely related to the color studies. A notebook is required to be kept, consisting of outlines given by the instructor and of original work of the student.

**COLOR AND DESIGN II.** Laboratory course, eight hours.

This course continues the study of the principles of color and design. Practical applications to dress and to home environment are made.

**NOTE.**—Color and Design II must be preceded by course I, and will not be given unless a sufficient number of students with preliminary training present themselves.

### **MANUAL TRAINING**

Assistant Professor BRAY

**MANUAL TRAINING METHODS AND ORGANIZATION.** Class work, four hours.

A course dealing with the history of manual training in the United States, as well as a similar development in foreign countries. A study is made of the different systems, the various forms of hand work, and the grades to which they are best adapted; the equipment and material required for each of the various lines of work, together with their cost and where they can be secured; also the best arrangement of equipment and its proper installation. The course will include lectures, recitations, discussions, reading, and written reports.

**MANUAL TRAINING FOR PRIMARY GRADES.** Laboratory, ten hours.

This course is designed to give instruction to teachers in those forms of hand work that have been found most profitable in the lower grades. The possibilities and adaptations of the different mediums are studied and methods of teaching the work are carefully considered. This work will include weaving, cord work, raffia, reed work, and cardboard construction. Lectures, discussions, and reports.

### **MECHANICAL DRAWING**

Professor SEATON  
Assistant BOWERMAN

**MANUAL TRAINING DRAWING.** Drafting, eight hours. No credit.

Instruction and practice in lettering and the use of instruments. Isometric and orthographic projection drawings are made of manual training problems. Practice is also given in tracing and blue printing.

**MECHANICAL DRAWING I.** Class work, two hours; drafting, four hours. Two credits. Required of all students in engineering courses.

The course includes the use and care of drawing instruments, with simple exercises in making working drawings from given plates. Special attention is given to the arrangement of views to secure balance, and to the subject matter and layout of titles and notes.

The following supplies are required: Triangle, T-square, pencils, scale, pens, eraser, thumb tacks, drawing paper, and a set of drawing instruments. Students are advised not to purchase these supplies until after consulting the instructor. Text, French's Engineering Drawing.

**MECHANICAL DRAWING II.** Class work, two hours; drafting, eight hours. Three credits. Required of all students in engineering courses.

Free-hand sketches are made from simple machine parts, followed by complete working drawings from these drawings without further reference to the subjects. Special emphasis is laid upon the proper selection of views to present the necessary information in convenient form, and to the dimensioning of the drawings. Text, French's Engineering Drawing.

### SHOP WORK

Assistant Professor CARLSON  
Instructor HOUSE  
Instructor HOLLAR  
Instructor HAYES  
Instructor GRANT  
Assistant PARKER  
Assistant TRUMBULL  
Assistant BALL

**WOODWORKING FOR THE GRAMMAR GRADES.** Ten hours, laboratory.

A careful study of the tools and processes used for woodworking for these grades. Lectures, discussions, and reports on methods of introducing and teaching this work. A course of suitable exercises for pupils of this age will be made, together with the construction of models, showing progressive steps, for class use.

**WOODWORKING FOR THE HIGH SCHOOLS.** Ten hours, laboratory.

A course in woodworking for high schools, in which a number of the most important exercises in joinery are carried out, with a study of their application, after which a series of articles in practical cabinet construction are made, with a study of the proper method of ornamenting and finishing. Lectures, discussions and reports.

**WOOD TURNING.** Ten hours, laboratory.

A course designed to prepare teachers for teaching wood turning in high schools. The work includes typical application of tools and tool processes, in turning between centers, on faceplates, and by means of hollow chucks. Exercises are given in turning cylinders, cones, beads, convex and concave curves, after which articles are made from drawings, which have a practical application in a student's home or social life, such as handles, mallets, rolling-pins, circular boxes with covers, Indian clubs, dumb-bells, napkin rings, bowls, towel rings, typical vase forms, cups, goblets, frames, ornamental stools, etc. While many of these articles are made from blue prints, it is the aim to have the student make some objects of value from his own designs, both as a project in turning and as a practical lesson in designing.

In connection with the laboratory work a careful study is made of the commercial value of wood turning, kinds of wood suitable for this work, methods of polishing and finishing work in the lathe, together with a study of suitable power transmission, shafting, belting, tight and loose pulleys, proper speed, etc.

**ADVANCED WOODWORKING.** Ten hours, laboratory.

A continuance of Woodworking for High Schools, in which an opportunity is furnished for taking more advanced cabinet construction, including wood carving and inlaying.

**BLACKSMITHING I.** Laboratory, ten hours.

In this course the field of hand-forging as related to high school is covered. The work includes practical exercises in making articles of use, which involves the operations of drawing, upsetting, welding, twisting, splitting, and shaping. Sufficient instruction is given the student in the forging of tool steel to enable him to make and temper many of the tools that will be needed in this and other branches of manual training in the high school. Lectures, discussions, and reports.

**BLACKSMITHING II.** Laboratory, ten hours.

Advanced work in the forging of iron and in the manufacture of tools such as punches, chisels, drills, scrapers and hammers. Instruction is given in the proper methods of heating, forging, hardening, tempering, annealing and working the various kinds of tool steel, and in the case-hardening of mild steel.

**BLACKSMITHING III.** Laboratory, ten hours.

Special work is given in the forging of iron and steel to impart skill in the different operations. Some practice will be given in the making of ornamental iron work.

**MACHINE SHOP I.** Laboratory, ten hours.

This course includes both bench and machine tool work, in which practice is given in chipping, filing, shaper and planer work, scraping, drilling, cutting, right and left hand and multiple threads, and murling on the lathe. Lectures and discussions accompany the work, so that the fundamental principles are more easily grasped by the student.

**MACHINE SHOP II.**

This course consists of progressive problems in turning and calipering, boring, reaming and taper turning and threading on the lathe, exercises in chucking, the use of forming tools, practice on the key-seating machine, and the making of a spur gear on the milling machine. A study is also made of cutting edges and tool adjustments best suited to the different metals, together with a study of cutting speeds and feeds.

**MACHINE SHOP III.**

This course takes up work on the turret lathe, boring mill; practical work is also given with jigs, templets, and a study made of the rapid production of duplicate parts, belts, lacings, and methods of belt connections, compound and differential indexing and the cutting of spiral gears on the milling machine.

NOTE.—The number of hours of credits in course offered in shop work will depend upon the amount and quality of work completed.

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## Division of Home Economics

MARY PIERCE VAN ZILE, Dean

### GENERAL COURSES

**PRESENTATION OF HOME ECONOMICS.** Two hours. No credit.

This is a study of methods of presentation of domestic science in grade and high schools. Attention is given to the application of the general principles of teaching to the teaching of home economics; to the planning of lessons and courses outlined, and to the equipment of laboratories.

**HOME ECONOMICS FOR RURAL SCHOOLS.** Lecture work, two hours.

This course will be under the direction of Miss Frances Brown, director of home economics in the Division of College Extension. All the work will be presented under rural school conditions, using rural school apparatus.

## DOMESTIC SCIENCE

Miss DOW  
Miss MEAD  
Miss SKINNER  
Miss DAVIS

**FOOD PREPARATION.** Class work, four hours; laboratory, eight hours. Four credits.

Foods are classified according to similarities in composition, which divide them into groups representative of the five food principles: carbohydrates, fats, proteins, mineral matter, and water. The carbohydrates and the fats are studied as to classification, composition, occurrence, and general properties.

*Laboratory.*—Principles underlying the cookery of the carbohydrates and the fats are illustrated in the preparation of representative foods.

**ADVANCED FOOD PREPARATION.** Class work, four hours; laboratory, eight hours. Four credits. Prerequisite: Food Preparation I.

This course is a continuation of Food Preparation I. It includes the study of the proteins and of the leavening agents.

*Laboratory.*—Principles underlying the cookery of proteins are illustrated by preparation of representative foods; practice is given in bread making and in cake making.

**DIETETICS.** Class work, four hours; laboratory, eight hours. Four credits.

This course comprises a study of the fundamental principles of human nutrition, as applied to the feeding of individuals under varying physiological, economic and social conditions; and a study of dietary standards.

*Laboratory.*—A practical comparison is made of the nutritive values of the common foods by computing, preparing and serving dietaries of specific costs in which specified nutrients are furnished. Prerequisite: Food and Nutrition I (see College catalogue); or Advanced Food Preparation.

**THERAPEUTIC COOKERY.** Class work, two hours; laboratory, eight hours. Three credits.

Abnormal conditions of digestion, assimilation, and metabolism due to disease are studied.

*Laboratory.*—This comprises a study of diet in relation to disease, together with the preparation of food suitable for the sick, including the arrangement of attractive trays for the invalid. Prerequisite: Dietetics.

**HOME NURSING.** Class work, six hours. Three credits.

This course is a study of furnishing and care of the sick room, the giving of baths, administration of medicine, recording symptoms, the giving of first aid to the injured, and the intelligent use of antiseptics and disinfectants.

## DOMESTIC ART

Miss DONALDSON  
Miss BUXTON  
Miss FECHT

**TEXTILES.** Class work, four hours.

This course will present the subject of textiles, including such topics as their beginnings in the art of primitive people. The study of fibers—cotton, wool, silk, flax; the manufacture and evolution in spinning and weaving.

**HAND AND MACHINE SEWING.** Laboratory, sixteen hours.

Hygiene in relation to clothing; suitability of clothing dependent on climate, occupation and general health; care and cleaning, repairing, relation of cost of clothing to income.



*Laboratory.*—Practice in hand and machine sewing as presented in the grades and high schools.

**GARMENT MAKING.** Laboratory, eight hours. Prerequisite: Hand and Machine Sewing.

Study of clothing; economics of spending; cost of clothing. Materials affected by adulterations; bargain sales; sweat-shop labor; quality, economy in selection, conditions affecting the hygienic and economic value of clothes.

*Laboratory.*—Drafting and making a shirt-waist dress.

**DRAFTING, DRAPING AND DESIGNING.** Class work, two hours; laboratory, eight hours. Prerequisite: Garment Making.

Principles of design and combinations of color as applied to dress. Laboratory practice in drafting patterns and draping from original or copied designs.

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## Division of General Science

J. T. WILLARD, Dean

### BOTANY

Professor ROBERTS  
Instructor WELLS

**AGRICULTURAL BOTANY.** Laboratory, eight hours.

The purpose of this course is to give high-school teachers a method of teaching botany that will bring the subject into closer relation to the farm and its problems. It is an attempt to render possible the study of botany in a scientific sense, but by the use, so far as practicable, of strictly economic plants for laboratory material. Considerable emphasis is laid on the study of plants from the natural-history standpoint. Most of the larger and more important groups of plants are studied from this point of view. The course will fall into the following divisions: (1) The plant and its work, two weeks; (2) the kinds of plants, one week; (3) the diseases of plants, one week; (4) weeds and their eradication, one week; (5) the improvement of plants, one week.

**DISEASES OF PLANTS.** Class work, two hours; laboratory, two hours.

The purpose of the course is to give teachers a practical working knowledge of the common diseases of agricultural and horticultural plants, and especially to enable them to learn to recognize these diseases in the field. A study is undertaken of the rusts, smuts, and leaf spot diseases of cereals and forage crops, of the common diseases of orchard fruits, such as apple blotch, apple scab, bitter rot, black rot, brown rot of plums and peaches, pear blight, etc., of the common diseases of the important truck crops, such as potatoes, cabbage, tomatoes, beans, etc., and some attention is given to diseases of ornamental plants, and forest trees.

The aim of this course is distinctly practical, and only so much investigation into the character of the fungi causing diseases will be undertaken as is absolutely necessary for the intelligent conduct of the course. The work will be entirely in the laboratory and field.

### CHEMISTRY

Professor WILLARD  
Assistant Professor NEWMAN  
Assistant MILLER

**CHEMISTRY I.** Lectures and recitations, six hours; laboratory, four hours. Four credits.

The term's work begins the study of elementary inorganic chemistry, and covers the elements of oxygen, hydrogen and chlorine and their com-

pounds, this being accompanied by theoretical treatment of the subjects of matter, energy, properties of gases, chemical law and theory, solution, electrolytic dissociation, acids, bases and salts, and chemical change as related to light, heat and electricity. Newell's *Inorganic Chemistry for Colleges* is used, this term's work covering the first 209 pages. The text is supplemented by lectures and amply illustrated by experimental demonstrations.

*Laboratory.*—As far as the time permits, the student performs independently experiments touching the preparation and properties of the more important substances. Preference is given to those operations which illustrate important principles, and the student is required as far as possible to study experiments in that light. *Laboratory Exercises in Elementary Chemistry*, by William McPherson, is used as the laboratory guide.

CHEMISTRY III. Lectures and recitations, six hours; laboratory, four hours. Four credits.

This work completes the study of elementary inorganic chemistry begun in the preceding terms, and includes consideration of fluorine, bromine, iodine, silicon, phosphorus, arsenic, antimony, and the metals.

*Laboratory.*—The laboratory work in this course is a beginning in qualitative analysis, for which McPherson's *Elementary Treatise on Qualitative Analysis* is the guide.

ORGANIC CHEMISTRY. Lectures and recitations, eight hours per week. Four credits. Chemistry III is a prerequisite.

A systematic study is made of examples of the more important classes of organic compounds in their logical chemical relations. Such substances as the hydrocarbons, alcohols, organic acids, fats, soap, sugars, starch, proteids, and other less known substances are treated with greater detail. Compounds used for clothing, food, fuel, light, antiseptics, disinfectants, anesthetics, poisons, medicines, solvents, etc., are included. The subject is amply illustrated by experiments in the lecture room.

QUALITATIVE ANALYSIS. Lecture, four hours; laboratory, eight hours. Four credits.

In this course the prime object is to increase the student's knowledge of chemistry as a whole. The standard methods of analytical chemistry are made the basis of a systematic study of the chemical properties of the most important metals, nonmetals, acids, bases, and salts. The teaching of analysis as such is a secondary object, although the student is held to the exact observations and careful reasoning required in ascertaining the composition of single substances and mixtures. The theories of chemistry receive constant application. The effect of the course is to broaden, strengthen, and unify the student's ideas of general chemistry, to enlarge greatly his knowledge of chemical facts, and at the same time to fix many of them in his mind by associating them with the reactions made use of in analytical processes. This subject must be preceded by Chemistry III.

*Laboratory.*—The regular methods of qualitative analysis serve as a basis for laboratory study of the chemical properties of substances. Laboratory manual, *Qualitative Analysis*, by W. A. Noyes.

## EDUCATION

Professor HOLTON  
Assistant Professor REISNER

HISTORY OF EDUCATION. Seven and one-half hours. Four credits.

This course will cover in the usual way the general history of educational progress from the earliest times to the present, except the educational development in the United States.

**SCHOOL ADMINISTRATION AND LAW.** Seven and one-half hours. Four credits.

This course will include a consideration of such subjects as the following: School and classroom management, the relation of the various ranks of school officers to one another, administrative measures and methods as practiced by state, county and local school authorities, and the important features of the Kansas school law.

**THE PHILOSOPHY OF EDUCATION.** Seven and one-half hours. Four credits.

This course will cover a careful discussion of the general aims and purposes of education. It will consider briefly the contribution of the great schools of science and art and discipline toward the relaxation of the general aim of education, and will attempt to lead the student to an understanding of how all the foregoing agencies are brought together in a larger unifying force.

**HISTORY OF EDUCATION IN THE UNITED STATES.** Seven and one-half hours. Four credits.

This course will include a consideration of the beginnings and the development of the various divisions and ranks of educational institutions in the United States. It will also give considerable attention to present-day tendencies in educational progress in this country.

**VOCATIONAL EDUCATION.** Seven and one-half hours. Four credits. Elective.

The development and significance of vocational education; careful study of trade and continuation schools in Germany, Massachusetts and elsewhere; practical schools of agriculture in France; folkehojskoler (people's high schools) in Denmark; agricultural colleges in the United States; Wisconsin and Minnesota county schools of agriculture and home economics; the social and economic phases of vocational education for the producer; its relation to moral welfare and social conditions; its place in the city, town and county schools; outlining of tentative courses in shop work, agriculture and home economics for Kansas schools; the relation of vocational education to the other school subjects; plans, equipments and cost of shop and laboratories. A study of the principles of pedagogy as applied to the teaching of vocational subjects in the high school and in the seventh and eighth grades.

**VOCATIONAL GUIDANCE.** Two hours. One credit, if taken with vocational education.

A study of the need of vocational guidance for pupils in the seventh and eighth grades and the high schools; economic and social waste without guidance; a study of the economic and social possibilities of the different vocations; how to study the vocations; bureaus of vocational guidance; the social engineer; the teachers as vocational counselors; a study of the literature on the subject. This course is especially intended for teachers of pupils in the upper grades and high schools, the high-school principals, village and ward-school principals, and superintendents of city schools.

**PRINCIPLES OF EDUCATION.**

Taking the purpose of education to be the preparation of the child for efficient participation in the life of society, the course aims at presenting the biological, psychological, economic, cultural and moral aspects of the educative process. Textbook, Ruediger: Principles of Education.

**TEACHING METHOD.**

The aim of this course will be the development of good classroom technique through a detailed study of child experience as related to the larger demands of education. The work will include lectures, library assignments and observation of classes. A feature of the course will be individual reports and discussions.

**EDUCATIONAL PSYCHOLOGY.**

The course will deal with those aspects of psychology that have a direct bearing upon educational practices. Special attention will be paid to the results of experimental investigation in this field. Lectures and library work.

**ENGLISH**

Professor SEARSON  
Assistant Professor OSTRUM  
Instructor DAVIS

**LITERATURE FROM THE READERS. Eight hours. Four credits.**

This course is planned to meet the needs of teachers of rural and graded schools. The aim of the course is to stimulate the teacher's love for good literature until she becomes conscious of her power to interest, impress and inspire boys and girls. Reading is considered both as a fundamental means of acquiring knowledge and as a stepping-stone to the appreciation of the world's best literature. Special emphasis will be placed upon teaching children how to study the reading lesson and upon the necessity to use in the reading lessons more of the literature of rural life. One hour each week is devoted to special methods of teaching reading.

**CONSTRUCTIVE ENGLISH. Eight hours. Four credits.**

This course is of special value to grammar-grade and high-school teachers desiring to learn practical present-day methods of teaching language and composition. The aim of the course is to train the student to express his thoughts clearly and accurately. The assignments of work are based on the experience and vital interests of the students, thus stimulating clear thinking as a practical basis for clear-cut, effective writing. One hour a week is devoted to the discussion of special methods of teaching grammar-grade and high-school English, and to a definite working program in the teaching of English.

**AMERICAN LITERATURE. Eight hours. Four credits.**

This course is designed for those desiring to take a special cultural course in literature, and is open to all who have completed the course in college rhetoric or its equivalent. The course includes a rapid survey of American literature from colonial times to the present and the intensive study and appreciation of the works of representative men of letters. Suggested supplementary readings enable the student to explore the richest fields of American literature. One hour a week is devoted to a consideration of current literature.

**HIGH-SCHOOL CLASSICS. Eight hours. Four credits.**

This course is intended especially for those teaching or desiring to teach high-school English and literature. The class work consists of lectures by the instructor, supplementary readings, and of interpretation by the class of passages assigned for study. The aim of this course is to awaken warm, vital appreciation of the best literature for high schools, and to inspire teachers to bring the deeper message of that literature to the hearts of the pupils. One hour each week is devoted to a discussion of the best methods of teaching literature and English in the high school.

**ENTOMOLOGY**

Doctor WELCH

**GENERAL ECONOMIC ENTOMOLOGY. Class work, seven and one-half hours. Four credits.**

This course is an elementary study of the dynamics of injurious insects. It consists of (1) a study of such structural features of insects as is necessary to the understanding of their elementary classifications, of their life history, and of the application of remedial measures; (2) a

study of the recognition marks, distribution, habits and life histories of the principal insect pests of the field, orchard and garden, domestic animals, and the household; (3) a study of the standard methods of their control. Several field trips are made to observe and study the habits of the insects in their natural environment.

## GERMAN

Professor CORTELYOU

**ELEMENTARY GERMAN I.** Seven and one-half hours. Four credits. Required in the course in home economics; elective in other courses.

After two periods given to the acquisition of the sounds of the German letters, the student at once begins reading. Vocabularies are learned from the outset, while grammar is acquired gradually through reading. Oral and written work and simple conversational exercises begin with the first reading lesson. In the work of this term there is included the study of articles, prepositions, declensions of pronouns, the indicative mode of the verb, and sentence order. Frequent reviews enable the student to digest the facts presented, while the abundant conversation and written work subserves the same end. Text, Becker and Rhoades' Elements of German (first twenty-five lessons).

**ELEMENTARY GERMAN II.** Seven and one-half hours. Four credits. Required in the course in home economics; elective in other courses.

The remaining important points of grammar are studied. Students are repeatedly drilled on the grammatical constructions already emphasized in Elementary German I. The general plan of the work is the same as in the preceding term. Essential facts of grammar are insisted upon, but German is taught as a living language. Conversational exercises in German and written translations from English into German are frequent. Prerequisite: Elementary German. Text, Becker and Rhoades' Elements of German (completed).

**GERMAN READINGS.** Seven and one-half hours. Four credits. Required in the course in home economics; elective in other courses.

This course embraces readings of dialogue selections which deal in detail with German life, customs, history, and mythology. A few of the best and most popular song poems also are studied. Grammatical drill is also continued, with occasional sight readings and translations into German. Prerequisite: Elementary German II. Text, Bacon's Im Vaterland.

**GERMAN COMEDIES.** Seven and one-half hours. Four credits. Elective in the courses in general science, home economics, and agriculture.

This course comprises the reading of recent one-act comedies of literary merit, and of a realistic, lively, and cleanly humorous nature, including the following: Julius Rosen's Ein Knopf, Gustav von Moser's Ein amerikanisches Duell, Hugo Mueller's Im Warteslon erster Klasse, and Emil Pohl's Die Schulreiterin. Exercises in conversation and sight reading are occasionally introduced. Prerequisite: German Readings. Text, Manley and Allen's Four German Comedies.

## HISTORY AND CIVICS

Professor PRICE  
Instructor ILES  
Instructor JAMES

**AMERICAN HISTORY I.—To 1845.** Seven and one-half hours. Four credits.

This course will cover the industrial, constitutional, and political phases of our American history, including origin, foundation, evolution from colonial conditions to independence, the establishing of nationality, our westward expansion, and the questions of the middle period. Library readings and reports; lectures and quizzes.

AMERICAN HISTORY II.—Since 1845. Seven and one-half hours. Four credits.

This course continues the study of the industrial, constitutional and political phases of American history, beginning with the annexation of Texas, and an intensive study of the slavery issue. It includes especially the economic, social and industrial conditions and effects of the Civil War, covers the reconstruction era, and includes such a study of the new nation as to give the student a clear grasp of present-day problems. Library readings and reports; lectures and quizzes. Students in either this or the above course are advised to bring any texts that they may possess on American history or government.

ENGLISH HISTORY. Seven and one-half hours. Four credits.

A survey of the whole field, with special emphasis on the modern period. The Tudor and Stuart regimes, with their bearings on constitutional development and New World history; the growth and organization of the empire and the more recent industrial, social and political advances will be studied in detail. Based on Cheney as a text, with lectures and assigned readings. A good course to precede civics and American history.

ANCIENT HISTORY, TEACHERS' COURSE. Seven and one-half hours. Four credits.

This course will include a survey of Oriental history, with a special study of selected periods and phases. It will be based on a standard text, with lectures and assigned readings. Some attention will be given to problems of presentation. A brief portion of the time will be given to the examination and discussion of the various textbooks in general use and to helps of all kinds. This course is designed for those who expect to teach ancient history in the high schools, but should be of value and interest to any others who desire advanced work in this period of history.

AMERICAN GOVERNMENT. Seven and one-half hours. Four credits.

A course in government and politics, with especial reference to the actual operation of local, state and national political machinery, and the newer devices for securing a more effective popular control, such as the direct primary, initiative, referendum, short ballot, and recall. A comparative study of the constitution and government of Kansas is supplemented by a discussion of the present tendencies in legislation and administration. Recitations, lectures, assigned readings. Text, Beard, *American Government and Politics*; or Guittreau, *Government and Politics in the United States*.

MODERN EUROPE. Seven and one-half hours. Four credits.

A course in the development of modern Europe. The period before 1648 is reviewed briefly, and special attention is given to the social and industrial development of the various nations since 1815, and to present international relations. This course is designed to meet the needs of the teacher, who, following the suggestions of the Committee of Five, prefers to emphasize the modern period in the high-school course in medieval and modern history. Recitations and assigned readings. Text, Robinson and Beard, *Development of Modern Europe*.

## MATHEMATICS

Associate Professor ANDREWS  
Assistant Professor WHITE  
Assistant Professor STRATTON

ALGEBRA I. Eight hours. Four credits.

A course in elementary algebra. The transition from arithmetic to algebra will receive careful attention. Text, *First Course in Algebra*, by Hawkes, Luby, and Touton.

ALGEBRA II AND III. Eight hours. Four credits.

These courses are a continuation of elementary algebra, including the general theory of the quadratic equation. Text, *First Course in Algebra*, by Hawkes, Luby, and Touton.

PLANE GEOMETRY I. Eight hours. Four credits.

The usual theorems and construction, including the general properties of plane, rectilinear figures, the circle, the measurement of angles, similar polygons, arcs, regular polygons; the solution of original exercises, including loci problems and the application to the mensuration of lines and plane surfaces. Text, Wentworth-Smith *Plane Geometry*.

SOLID GEOMETRY. Eight hours. Four credits.

The usual theorems and construction, including the relation of the planes and lines in space, the properties and measurement of prisms, pyramids, cylinders, and cones, the sphere and the spherical triangle; the solution of many numerical and original exercises, including loci problems; application to the mensuration of surfaces and solids. The application of geometry to the arts and sciences will be made, and in particular the use of engineering and architecture as problem sources will be shown. The course will proceed from the modern pedagogical and practical point of view. Text, Wentworth-Smith *Plane and Solid Geometry*.

SECONDARY MATHEMATICS. Five hours.

This course undertakes a critical examination of the mathematical field of the secondary school. This embraces a careful examination of the contents of secondary algebra, geometry, and trigonometry; an extensive study of the reports of the International Committee on the Teaching of Mathematics; critical examination of various pedagogical theories of presenting secondary mathematics; secondary-school problems in mathematics; resources available for secondary instruction; objective points in teaching algebra, geometry, and trigonometry; history and bibliography of secondary mathematics. Lectures, assigned readings, and reports.

PLANE TRIGONOMETRY. Eight hours. Four credits.

Trigonometric functions of any angle. Measurements of angles. Solution of plane triangles. Functions of multiple and submultiple angles. Sum and difference formulas, trigonometric equations, and inverse functions. DeMoivre's theorem, trigonometric series, hyperbolic and exponential functions. The use of trigonometry as a scientific instrument and as a part of a liberal education will be emphasized. Text, Rothrock's *Plane and Spherical Trigonometry*.

ANALYTICAL GEOMETRY. Eight hours. Four credits.

The work of this course is confined to the plane, and includes a treatment of coördinate systems and applications, loci, the straight line, circle, parabola, ellipse, and hyperbola; also a brief consideration of secants, tangents, and normals. The subjects treated are those usually embraced in a first course. Text, *A brief Course in Analytic Geometry*, by Tanner and Allen.

DIFFERENTIAL CALCULUS. Eight hours. Four credits.

Following the usual introductory ideas, the principal topics taken up are the fundamental rules for differentiating standard forms, applications, maxima and minima, curve tracing, curvature, and partial differentiation. Especial attention is given to the applications of the calculus to problems in geometry and mechanics. Textbook, *Differential and Integral Calculus*, by Granville.

INTEGRAL CALCULUS. Eight hours. Four credits.

This course contains a discussion and practical use of formulas for integrating standard forms, a treatment of the constant of integration, and the idea of the definite integral. Emphasis is placed upon the application to curves in problems involving areas, lengths, surfaces and volumes, rather than upon the various methods of integration. Attention is given to both single and multiple integration in connection with the usual problems in geometry and mechanics. Textbook, *Differential and Integral Calculus*, by Granville.

## MUSIC

Professor VALLEY

RUDIMENTS OF MUSIC. Class work, four hours.

This course takes up the staff, scale, signatures, ear-training, sight-reading, rhythm, singing, relationship of the different tones of the scale, and a great deal of practice and drill on the fundamentals in music.

PRIMARY GRADES. Class work, four hours.

A study of the best recreation and rote songs for the primary grades. Practice in singing and methods of presentation of recreation and rote songs. Treatment of monotones. Care of child's voice.

INTERMEDIATE GRADES. Class work, four hours.

Exercises and songs best adapted to these grades. Melody and rhythm, chromatic and minor scales, etc. Best methods of presentation of music in these grades. Drill on fundamentals. Care of child's voice.

GRAMMAR AND HIGH-SCHOOL GRADES. Class work, four hours.

Part songs, codas and choruses best adapted for young people in these grades. Drill and practice in singing. Best methods of presentation. Study of changing of young people's voices, range of voices, and care of children's voices.

VOICE CULTURE AND SINGING.

Arrangements for individual instruction in voice culture and singing may be made by seeing Professor Valley.

## PHYSICAL EDUCATION

Professor LOWMAN  
Instructor HUTTO

These courses are offered to meet the needs of teachers who wish to qualify themselves for more efficient direction of and instruction in physical education in the public schools. The courses are planned to meet the needs in both theoretical and practical phases of the work. The course in practical work will be beneficial to those who are interested in their own health development. Hours of credit will depend upon amount of work.

### I.—PHYSICAL EDUCATION IN THE PUBLIC SCHOOLS.

This course will consist of lectures and discussions three times a week, with one hour for outside reading. History and development of physical education; present status. The development of the rational system of physical education.

*Elementary Schools.*—Emphasis is placed on the growth and development of the child, the factors controlling this growth and development, and the place of motor activities among these factors. Organizations and methods discussed in detail. The introduction of rational gymnastics, plays, and games.



*High Schools.*—Following a summary and study of the characteristics, tendencies and needs of adolescence, this course considers the exercises to be used, the condition of the individual students, the methods of studying such conditions, the social and moral leadership necessary, and the administration of competitive exercises, especially athletic.

## II.—PLAYGROUNDS.

*Methods.*—This course treats of the development of the playground movement in the United States; the necessity of the playground; playgrounds in the large city; in the small town; how to start and maintain playgrounds; supervisory organizations, location, construction, and administration.

Suggestions to the playground directors in regard to (a) the educational value of directed play, (b) equipment of the grounds, (c) publicity work, (d) time and hours, (e) the daily playgrounds, (f) special days, (g) clubs, (h) government on the playground, (i) activities to encourage, (j) the special games for the playground, with special emphasis to the rural problem.

## PHYSICS

Professor HAMILTON  
Instructor JENNESS  
Assistant RABURN

INTRODUCTORY PHYSICS. Class work, nine hours; laboratory, two hours.

This course is designed for those teachers who desire some knowledge of elementary physics and yet do not have time to take the three regular courses offered in this subject. The entire subject will be covered and some time given to working problems. Simple experiments and demonstrations will be given. The course will be a good review for those who have had high-school physics. Students who expect to take county examination for certificates to teach are advised to take this course. No college credit is given. Textbook, Milikan and Gale.

ELEMENTARY PHYSICS I. Class work, seven and one-half hours; laboratory work, two hours. Four credits.

This course is intended to give a general view of the subjects of mechanics and sound. Special emphasis is placed upon those principles which will be met again in later work in the same or other sciences. Textbook, Milikan and Gale. Prerequisite: Algebra III.

ELEMENTARY PHYSICS II. Class work, seven and one-half hours; laboratory work, two hours. Four credits.

This course includes a study of heat and light, and is a continuation of Elementary Physics I. Discussion of the most important laws involved in each of the above, together with the explanation of many everyday phenomena, is followed by problems. Prerequisite: Elementary Physics I. Textbook, Milikan and Gale.

ELEMENTARY PHYSICS III. Class work, seven and one-half hours; laboratory work, two hours. Four credits.

This course is a continuation of Elementary Physics I and II, and includes a study of magnetism and electricity. After a brief study of magnetism, the fundamental laws of electricity are studied and illustrated, and the working principles of many of the electrical appliances in daily use are made subjects for class discussion. Prerequisite: Elementary Physics I. Textbook, Milikan and Gale.

Students receiving credit in any of the three elementary courses above may substitute the grade for similar required work in the School of Agriculture.

**PEDAGOGY OF PHYSICS.** Class work, seven and one-half hours; laboratory, four hours. Four credits.

This course includes a study of the modern texts, manuals and methods in high-school physics. Students are given an opportunity to help assemble apparatus and to assist in lecture demonstrations. The laboratory work will include the usual experiments required in the elementary course in physics. The purpose of the course is to discuss methods best adapted for the presentation of those topics which present special difficulty, to devise methods of illustrating and demonstrating the fundamental principles, and to select from a large number of possible laboratory experiments a list which might be used in any of our Kansas high schools. This course is intended for those who are either teaching or expect to teach physics in secondary schools.

**ELECTRICITY AND LIGHT.** Class work, seven and one-half hours; laboratory, four hours. Four credits.

An advanced course in electricity and light. The course is the same as is required of all engineering and general science students, and gives the student a working knowledge of the units employed in measuring current, the various methods of producing current, and acquaints him with the electrical appliances used in both current production and electrical measurements. The work in light covers the principal phenomena of light, with a study of light as an exact means of physical measurement. The laboratory work includes the work with generators and motors, photometers, lamp tests, spectrometer, and advanced problems in both electrical measurements and light. Text, Kimball.

**HOUSEHOLD PHYSICS.** Class work, seven and one-half hours. Four credits.

A course of lectures and demonstrations, in which the laws relating to principles involved in appliances of the household are explained and illustrated. The work in heat is based upon thermometry, calorimetry, radiation, absorption, and methods of refrigeration and ventilation. The course includes a study of light, with its color phenomena and actinic effects; of some of the optical instruments used in scientific work; a study of electric lighting and illumination, and of the cost of operating many of the appliances used in the home, including suggestions for the proper use and care of electrical apparatus for the protection of the appliance and of the operator.

**PHOTOGRAPHY.** Class work, three hours; laboratory, six hours. Three credits.

The importance of a record of exact details, as shown in photograph, makes this work valuable to all scientists. The course gives the student some knowledge of the chemical and physical principles involved in the art, as well as practice in making good negatives and prints. The lecture and laboratory work deals with: things to be considered in selecting a camera; proper exposures; composition of pictures; proper development of plates; tests of different developers; retouching; reducing and intensifying negatives; printing and mounting; making lantern slides, bromide enlargement, and the prints best adapted for illustrated articles in newspapers and magazines.

ZOOLOGY

Assistant Professor ACKERT

GENERAL ZOOLOGY. Class work, seven and one-half hours. Four credits.

A study of types of animals selected to illustrate the development of the invertebrates, together with a series of field trips. The latter includes excursions to ponds, streams, and meadows, where students collect their own material in order to become acquainted with habitats. Animals found are studied in relation to their own species, and to other animals, including man. The field trips afford also an opportunity to become acquainted with the names, and, to some extent, the classification, habits and economic importance of the summer birds and a few of the common mammals.

## Division of College Extension

JOHN HAROLD MILLER, Dean.

Until 1905 the work of college extension, in the form of farmers' institutes, was in charge of a farmers' institute committee of the College. Applications for college lectures at the institutes were referred to this committee, and such members of the Faculty as happened to be available were detailed to attend the meetings. The State appropriation for institute work was small, no regular staff could be employed, and the institutes themselves were for the most part unorganized and of a temporary and sporadic character. The first step toward the development of the institute work was taken in the employment by the Board of Regents of a superintendent, who assumed the responsibilities of the organization of the work in October, 1905. In July, 1906, the Department of Farmers' Institutes was formally organized by the Board of Regents. An energetic prosecution of the work of agricultural extension had resulted in an awakened interest throughout the State, and in a legislative appropriation of \$4000 in 1905, to which amount the College added \$800. In 1907 the results of the extension work were seen to be so valuable that the legislature appropriated \$11,500, to which the College added \$1000. In 1909 the legislature, with unprecedented liberality, made an appropriation for agricultural extension work of \$52,500, just five times the appropriation made by the preceding legislature. The legislature of 1911 appropriated for this department \$35,000 for the year ending June 30, 1912, and \$40,000 for the year ending June 30, 1913. The legislature of 1913 appropriated for the Division of College Extension, \$45,000 for the year ending June 30, 1914, and \$50,000 for the year ending June 30, 1915.

The many developments of the extension work made it necessary, in the judgment of the Board of Regents, to create, in December, 1912, the Division of College Extension, consisting of four distinct sections—the Department of Farmers' Institutes and Demonstrations, the Department of Highway Engineering and Irrigation, the Department of Home Economics, and the Department of Correspondence-Study—each with its own head and staff; the Board of Regents made the Director of Extension, Dean of the Division of College Extension.

The principal value of the Agricultural College, as a teaching factor, must be in the training it is able to give to the young people who enter upon and continue through its courses

of study, in residence. The Agricultural Experiment Station, as a natural adjunct to the College, has its great field in the discovery of new truths relating to agriculture. So long, however, as the institution limits its efforts to these lines, it is evident that only a small proportion of the people of a state can derive direct and practical benefit from the work of the College. The progress of agricultural education would be slow indeed if the Agricultural College did not offer other forms of instruction to the people of the State. The same economic principle that justified the expenditure of public funds for educating young people who are able to attend the College justifies a similar expenditure for the purpose of taking the College to those who are not able to come to it. State education is not philanthropy, but self-protection—fore-sight. An educated citizenship is a prosperous citizenship. The Kansas State Agricultural College, through its several lines of extension, conducted meetings during the year ending June 30, 1912, with an aggregate attendance of 349,967 people—more than one-fifth of the population of the State.

While this work is directed by the Division of College Extension, the scope would be very limited were it not for the co-operation of the other divisions and departments of the College in supplying speakers for institutes, assistants in various lines of demonstration work, teachers for movable schools, and wise counsel in the various lines of public effort.

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### Farmers' Institutes and Demonstrations

EDW. C. JOHNSON, Superintendent  
P. E. CRABTREE, Farm Crops  
C. H. TAYLOR, Animal Husbandry  
GEO. O. GREENE, Horticulture  
A. S. NEALE, Dairy Husbandry  
W. A. BOYS, Demonstration Agent, West Central Kansas  
LEE H. GOULD, Demonstration Agent, Southwestern Kansas  
H. J. BOWER, Demonstration Agent, Southeastern Kansas  
H. T. NIELSON, Demonstration Agent, Northwestern Kansas

The farmers' institutes of the State have regular officers, constitutions and by-laws, and are required by law to meet at least annually. Many of these organizations also hold six or more monthly meetings. The College plans to send one or more speakers to present at a meeting certain well-defined lessons in some branch of agriculture. The speakers and their subjects are chosen because of a known need or interest in a particular community, and with a view to starting or encouraging certain definite lines of agricultural work. Effort has been made to build up a fixed membership in these institutes, and the list of members reported to this department up to March 1, 1914, is about 16,000. This membership roll constitutes the mailing list for the regular pamphlets issued by this department to the members of the farmers' institutes. In addition to these pamphlets, each member who fills out and returns a membership blank will receive from the College, from the Government, or from some State Experiment Station such other obtainable literature as his interests

demand. Each year some special topic, such as live stock, plant breeding, gardening, orcharding, or dairying, is made especially prominent in institute programs, either for the whole State or for certain specified districts. Special meetings are held by approximately two-thirds of the institutes, for the discussion, on certain designated days, of special subjects, such as "Alfalfa," "Poultry," "Good Roads," "Seed Selection," "Silos and Silage," "The Farm Horse," etc.

The programs for all regular meetings are based on suggestive outlines sent out by the Institute Department. When these are returned by the local committees, the programs and posters are printed and sent out free. The department furnishes literature, on request, for members who are to take part in the program of an institute, a grange, or other organization. During the campaign beginning September 1, 1913, and ending March 15, 1914, the College assisted in the holding of 183 two-day institutes and 221 one-day institutes—a total of 404 institutes, having an aggregate attendance of more than 73,320 farmers, with their families.

#### MONTHLY MEETINGS

One of the most important features of the farmers' institute work in this State is the custom of having each farmers' institute organization hold from six to nine monthly meetings. These meetings are held usually on the afternoon of the second Saturday of each month from September to May. The Department of Farmers' Institutes suggests the subject for discussion, and the same subject is to be discussed in each and every institute in the State. In this way certain very important subjects have been discussed by thousands of farmers at seasonable times, looking to somewhat general unanimity of action. The subjects discussed at these monthly meetings have included such as "Home Orchard," "The Silo," "Seed-bed Preparation for Corn," "Seed-bed Preparation for Wheat," "Care of Brood Sow and Litter," "Sorghum," "Road Improvement," "Consolidation of Rural Schools," etc. The department has made a requirement that every institute must hold at least three of these monthly meetings, in addition to the annual meeting, before being entitled to aid from the county.

#### DEMONSTRATION FARMING

GENERAL FIELD DEMONSTRATIONS. After speakers from the Agricultural College have attended institute meetings and discussed certain methods of farming, requests have come from farmers that the College send men into those communities to put to a practical test the theories advocated. Therefore, four or five members of the department have usually spent the time from March to July in various field demonstrations, including pruning and spraying orchards, building silos, inspecting dairy herds, making plans for dairy barns, visiting farmers and advising as to farm management.

DISTRICT DEMONSTRATION AGENTS. In addition to the advisory demonstration work indicated in the preceding paragraph, the College has employed four district demonstration agents, one with headquarters at Norton, with demonstration work in several counties in the northwestern corner of the State. Another district demonstration agent has been

located at Hays, conducting work in counties along the Union Pacific lines in western Kansas. A third district demonstration agent has been located at Dodge City, conducting demonstrations in the counties in the southwestern part of the State, the College being assisted in salary and expenses by the Atchison, Topeka and Santa Fe Railway Company and the United States Department of Agriculture. A fourth district demonstration agent has been assigned several counties in southeastern Kansas, with headquarters at Parsons, the College being assisted here by the United States Department of Agriculture. These men conduct demonstrations on from four to six farms in each county in the assigned territory in the growing of crops and in the feeding of stock.

COUNTY DEMONSTRATION AGENTS. The College has assisted in the location of five county demonstration agents in the following counties: Leavenworth, Montgomery, Cowley, Allen, and Harvey. The College, however, assumes no expense for the work of these agents, but directs the various demonstrations.

#### BOYS' AND GIRLS' CONTESTS

In the hope of creating a keener interest in rural life, contests in growing corn, potatoes, etc., and in baking, fruit canning, and sewing were inaugurated. They are usually considered a part of the work of the farmers' institutes and are for the most part conducted by these organizations. Prizes are arranged for, which in some counties aggregate as much as \$400. Prizes for boys and girls fifteen years old and over are given in the form of free trips to the State institute held at the Agricultural College each winter. This is clearly educational work, and many county school superintendents state that these contests in corn, bread, etc., have stimulated the entire year's work of country schools. Beginning with 1911, the rules for the contest were changed, and three additional recommendations were made: (1) Each boy shall plant one acre of corn, from which his ten ears must be selected for the contest. (2) Any boy may join a yield contest, provided he notify the executive committee of his institute, on or before the first of October, that he thinks his acre will yield, for all territory east of the Sixth Principal Meridian, seventy-five bushels, for the next three counties west (to the west line of Barton and Smith counties), sixty bushels, and in all territory farther west, forty bushels per acre, of corn or kafir. (3) Institute committees are urged to introduce, for boys between the ages of seventeen and twenty-two, a five-acre contest; the contestant to notify the committee on or before the first of October that he thinks his corn will yield seventy-five, sixty, or forty-five bushels per acre, according to territory. The College recommends that the prize for the one winner in this contest be \$50 cash on condition that the winner attend the Farmers' Short Course at the Agricultural College for ten weeks.

#### BOYS' AND GIRLS' MEETINGS

The College is inaugurating a system of special meetings for the boys and girls who engage in the various contests. This work will usually be conducted in the form of a county campaign, consisting of four or six afternoon meetings a week, for the purpose of reaching the boys and girls engaged in the various contests. When these young people become

sufficiently interested the representatives of the College will assist them in forming organizations to be known as boys' good farming clubs and girls' home economics clubs. The College is also organizing, in towns and villages of the State, "boys' poultry clubs" and "boys' garden clubs." "Girls' flower clubs" will also be organized where there are no "city beautiful leagues." Special circuits will be arranged for these boys' and girls' meetings, similar to those of the regular farmers' institutes, and the officers of these clubs will report to a College official as do the officers of the institutes.

#### MOVABLE SCHOOLS IN AGRICULTURE

As a means of intensifying the work of the farmers' institutes, movable schools are to be held in those communities that have high institute records. Schools will be conducted in dairying, poultry, orcharding, stock judging and breeding, corn culture, road making, and concrete construction. These schools will continue for three days, from nine A.M. to four P.M. There must be a membership of not less than twenty-five nor more than forty, and each member must pay a fee of one dollar to meet the necessary expenses. Where a class of sixty is formed, two instructors will be sent and two courses will be offered. In case a single school possesses a total membership of sixty men and forty women, the instruction may be continued for a period of five days.

#### SCHOOL CAMPAIGNS

A state campaign for agricultural education would be incomplete if it did not affect the rural schools. According to a recent legislative enactment, all teachers are hereafter required to take an examination in elementary agriculture. It is not required that agriculture be taught in the rural schools of the State, but within the next two years it will undoubtedly become a part of the daily course of study of every school in Kansas. In coöperation with the county school superintendents and institute workers, the Agricultural College is each year holding "schoolhouse campaigns" in a few counties, for the purpose of stimulating interest in agriculture among children, teachers, and patrons. In these campaigns the College representative is usually able to speak in four schoolhouses each day, and to give a lecture in the evening, either in a rural schoolhouse or in some village. The representatives sent to the different counties are chosen with reference to the prevailing interests of the respective localities.

#### AGRICULTURAL TRAINS

The College has enjoyed for several years the coöperation of the leading railroads of Kansas in the matter of special educational trains, such as corn, alfalfa, wheat, dairy, drainage, and good roads trains. By this means it has been possible to meet many thousands of people and to impress upon them in a forceful way the importance of seed selection, of improved methods of culture, of the value of better dairy stock, silos, etc.

#### COOPERATIVE ASSOCIATIONS

Another form of effort to make practical the instructions given in the farmers' institutes is the organization of coöperative breeding associations, fruit growers' associations, vegetable growers' associations, com-



munity breeding associations, etc. Year by year greater effort is being made to induce farmers to put into practical operation the plans discussed at the meetings.

#### EXHIBITS AT FAIRS

For four years the Department of Farmers' Institutes and Demonstrations has been preparing and furnishing for county fairs a very complete exhibit relating to agriculture and home economics, the exhibit consisting of from fourteen to sixteen large boxes containing charts, photographs and other illustrative material, illustrating important agricultural experiments and important agricultural and economic information.

#### PUBLICATIONS

Since definite subjects are selected for each year's institute work, with a view to bringing about a certain unanimity of action, it seems appropriate that some of these subjects be treated more at length, be published in pamphlet form, and then be mailed to all institute members. These pamphlets were first issued as special numbers of *The Industrialist*, but later, under the name of *Agricultural Education*, were entered in the post office as a regular periodical. There is a membership fee in all institutes; all members receive free from four to six or more numbers of the periodical during each year. A large edition of each number is printed, and back numbers are mailed to new members until the supply is exhausted.

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### Highway Engineering and Irrigation

W. S. GEARHART, State Highway Engineer  
H. B. WALKER, Drainage and Irrigation  
A. R. LOSH, Assistant Engineer  
C. I. FELPS, Assistant Engineer  
W. J. KING, Assistant Engineer

#### HIGHWAY ENGINEERING

It is eminently proper that the Agricultural College should maintain a trained highway engineer who is primarily the State adviser for county and city officials on matters relating to roads and bridges. He makes plans and specifications for bridges and culverts and advises as to their location. He examines proposed highway improvements, and, if it is desired, makes plans and specifications for such road work, whether the improvement contemplates the use of macadam, oil, or sand-clay, or is simply to be an improved earth road. Later, if desired, he will inspect all bridge and road work on its completion, and report its condition to the proper county or city officials. All such work is done without charge to the local community, other than for actual traveling expenses. When other work will permit, he also advises bridge contractors, and furnishes plans, specifications, etc., on the same terms as to officials, except that the contractor will be charged the actual cost of a draftsman's time in drawing the plans.

#### DRAINAGE AND IRRIGATION ENGINEERING

It has been found by careful investigation that there are more than twenty counties in eastern Kansas where large areas of valuable land are in great need of systematic tile drainage. In October, 1910, the

Agricultural College employed, and is now maintaining, a public drainage engineer whose duties are outlined much as are the duties of others connected with this department—attending farmers' institutes from October to March, and from March to October advising with farmers, county surveyors, and engineers, relative to the best and most economical plans of straightening creeks and rivers, and draining fields and farms, and of developing plants for farm irrigation. To this engineer are assigned all problems relating to farm irrigation and land drainage. His services are absolutely free other than the usual charge for traveling and local expenses.

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### Home Economics

FRANCES L. BROWN  
FLORENCE SNELL  
ADAH LEWIS  
EDITH ALLEN

While thousands of young women have had residence instruction in domestic science at the Agricultural College, there are still many other thousands who have been unable to take advantage of the excellent facilities which the College possesses in this field. Therefore, the Division of College Extension employs four competent teachers and demonstrators in this subject, to carry instruction in home economics to these absent ones. These teachers attend farmers' institutes for the regular institute period of five months, hold "movable schools" for three months, and then hold "women's meetings," and attend teachers' institutes, chautauquas, grange meetings, women's club meetings, etc., the rest of the year. At all times an extensive correspondence is carried on with the women and girls of the State. Girls' home economics clubs are also organized in high schools and in rural neighborhoods, using regular cooking and sewing lessons sent out from the department. Correspondence with women's clubs is also invited relative to occasional lessons in cookery, for which printed lessons are sent on request.

#### MOVABLE SCHOOLS IN HOME ECONOMICS

The College is able to reach a limited number of persons by means of its actual class and laboratory work. The institute program reaches many more with its system of lectures and addresses. In addition, the movable schools in home economics, giving definite courses of instruction which occupy at one place a period of one week, enable the College to carry its educational services directly to the homes of the people. These schools continue during a single week, from 1:15 P. M., Monday, to 11:45 A. M., Saturday. The sessions of the schools of economics are conducted according to the following program: cookery, from 9 to 11:45; sewing, from 1:15 to 3:45; "round table" for the public, from 4 to 5. For a course to be organized, it should have not less than twenty and not more than forty members. A fee of one dollar a member is paid to the local committee for the purchase of supplies, and for the entertainment of the two College teachers who conduct the class. No visitors are permitted until after the conclusion of the day's work, at 3:45 P. M. The sessions of the schools are held in the months of March, April, May, and September.

**GIRLS' HOME ECONOMICS CLUBS**

The College is able to give personal instruction in home economics each year to only about eight hundred girls; through the movable schools it is not likely that more than five hundred women and girls can be reached annually with the limited instruction that can be given by the present force of teachers during the periods of one week each; through the farmers' institutes and women's institutes, not more than five thousand women are likely to receive the information that can be given in the more or less formal discussions; through correspondence courses it is not probable that more than a few hundred persons will be reached. The College is, therefore, undertaking in addition the work of organizing hundreds of girls' home economics clubs in town and village high schools, and in rural communities. A certificate is granted to a club having six charter members, although better results are likely to follow from a larger membership. Printed lessons in cooking and sewing are supplied by the secretary of the club, together with blanks for reports, which are to be handed in after each lesson. Literature relating to the work being conducted is sent by the College to the individual members of the clubs. In a limited way this is a form of correspondence study, and girls can to a certain extent be prepared for either the regular correspondence courses, for domestic science work in high school or college, or for their usual home duties. The work also prepares the way for the regular teaching of domestic science and art in the high schools of the State. It is hoped that it may be arranged for a College representative to visit these clubs annually. A small charge, to be paid the College, is required of each club organized under the College auspices.

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**Correspondence Study**

J. C. WERNER, Director  
GEO. E. BRAY, Assistant

The Kansas State Agricultural College offers to the men and boys and the women and girls of Kansas an opportunity to study agriculture, home economics, mechanic arts, and farm engineering at home, alone, or in groups, believing that it is as much a part of the province of the institution to offer such instruction to those who can not attend the College class as it is to offer instruction to those who are able to undertake studies at the College. Opportunity is therefore offered for systematic study by correspondence in many subjects which have a direct bearing upon the problems of the farm and the home.

Three lines of work are offered for the purpose of helping those who have only limited time to study on any particular subject, but who need help, and then more extended courses for those who have more time. An opportunity is also offered for those who wish to study with the idea of securing college credit.

## FOR WHOM INTENDED

The correspondence courses here outlined should be of especial interest to the following classes of persons:

(1) Boys and girls who have completed the common-school course of study, but who can not immediately attend a high school or other preparatory school.

(2) Young men and women who feel that their school days are over, but who have aspirations, not yet satisfied, for a better education.

(3) Men and women of middle life who wish to know more of the sciences of the farm and of the home.

(4) Men who have been farming along general lines, but who have developed an interest in some special kind of work, such as orcharding or dairying, and who wish to direct their attention chiefly to that field.

(5) Road supervisors who need to know more of the science of road making, the building of culverts, etc., but who can not afford to stop their work and take a special course.

(6) Men and women who have passed middle life, who are about to retire from active farming, but who intend to keep their minds young by study, and who desire to enrich their own experience by adding to what they themselves have gained a knowledge of what has been discovered by others.

(7) Capitalists and business men who are holding investments in lands, and who should know how to make those investments increase in value.

(8) Teachers who desire to teach agriculture or home economics in special classes, or who wish to learn how to enrich their teaching in the sciences.

Only a small percentage of the farming population of Kansas is able to attend the classes in the Agricultural College; in all, about 100,000 people attend the farmers' institutes; a few hundred attend the movable schools. There still remain nearly a million adult people living in the country, few of whom have ever read carefully a single book on farm crops, dairying, horticulture, farm drainage, or the like. The College is now prepared to offer correspondence courses in the following subjects:

## READING COURSES

Alfalfa.  
Beef Production.  
Breeds of Cattle.  
Breeds of Horses.  
Breeds of Sheep and Swine.  
Canning and Preserving.  
Care of Children.  
Corn.  
Dry Land Farming.  
Farm Dairying.  
Hog Raising.  
Home Decoration.  
Household Bacteriology.  
Incubating and Brooding.  
Injurious Insects, Field.  
Injurious Insects, Garden.

Injurious Insects, Orchard.  
Orcharding.  
Potato Growing.  
Poultry Disease Prevention.  
Poultry Feeding and Housing.  
Rural Hygiene.  
Sanitation and Health.  
Sheep Feeding.  
Sheep Raising.  
Silos and Silage.  
Soils.  
Sorghum Crops.  
Stock Feeding.  
Study of Child Life.  
Tree Planting.

EXTENSION COURSES

Animal Breeding.	Gasoline and Kerosene Traction En-
Automobiles.	gines.
Blacksmithing.	Highway Construction.
Carpentry and Building.	Home Nursing.
Civics.	Home Sanitation.
Concrete Construction.	Household Management.
Cookery.	Insects Injurious to Farm Crops.
Dairy Manufacturing.	Insects Injurious to Orchard Crops.
Elementary Architectural Drawing.	Landscape Gardening.
Elementary Woodworking.	Machine Shop Work.
Farm Blacksmithing.	Pattern Making.
Farm Builders.	Plumbing.
Farm Dairying.	Sewing.
Farm Drainage.	Shop Mechanical Drawing.
Farm Machinery.	Shop Mathematics.
Farm Mechanics.	Soils.
Farm Woodworking.	Steam Boilers and Engines.
Foundry Practice.	Steam Traction Engines.
Gasoline Engines.	Stock Feeding.

COURSES GIVING COLLEGE CREDIT

Algebra.	Geometry, Solid.
Ancient History.	History of Education.
Animal Breeding.	Manual Training Drawing.
Elementary Agriculture.	Medieval History.
English Classics.	Methods of Teaching.
English Readings.	Modern History.
Evolution of Domestic Animals.	Philosophy of Education.
Farm Crops.	Poultry Management.
Floriculture.	Projection Drawing.
Forage Crops III.	Rural Sociology.
Forestry, Farm.	School Law and Management.
Fruit Growing.	Sociology.
Geology.	The American Nation.
Geometrical Drawing.	Vegetable Gardening.
Geometry, Plane.	Vocational Education.

## Student Organizations

### STUDENT COUNCIL

The student council is a representative body which was organized by the students in 1909 and received official sanction from the Board of Regents and the Faculty of the College. Its objects are: "(1) To act as a representative body before the governing officers of the College in all matters that concern the individual students, student organizations, or the student body as a whole; (2) to act as a body of mediation between different student organizations or enterprises whenever such service is sought by such organizations or enterprises; (3) to take cognizance of all matters that pertain to the good name and scholarship of the student body, to the end that high standards of honor on the campus and elsewhere may be maintained."

This student council consists of four members elected from the senior class, three from the junior, two from the sophomore, and one from the freshman class. In addition, the School of Agriculture elects a delegate, who has the privilege of speaking on subjects pertaining to his school, but has no vote. At each meeting of the council a committee of the College Faculty may also be present to participate in the discussions. The members of the council are elected each term, but at each election at least two of the representatives of the senior class and one of those of the junior class must be reelected.

The student council occupies an interesting and valuable place in the College life, and as a whole may be said to be an unqualified success in establishing a system of representative government among the students touching affairs peculiarly their own, and also in matters involving the Faculty. All acts of the council are submitted to the President of the College, and if they concern the rules, regulations, or ordinances of the College, are subject to approval by the proper governing body. The council is especially helpful in maintaining a high standard of honor among the students in both individual and organized relations. As a means of securing a better understanding in matters likely to cause friction between the student body and the Faculty, the council performs a most important function.

### THE CHRISTIAN ASSOCIATIONS

The Young Men's Christian Association and the Young Women's Christian Association are organizations of the greatest worth and value in the College community, forming centers of moral culture and religious stimulus among the young men and women during their developmental period. As is well known, the Christian associations in colleges stand for the best ideals among the students, and are always accorded the cordial support of the authorities. In addition to general moral and spiritual development, the College Christian associations are of practical and

efficient influence among the students in many directions. Membership in these associations is limited to persons connected with Protestant evangelical churches, but others are admitted as associate members.

THE YOUNG MEN'S CHRISTIAN ASSOCIATION.

The College Y. M. C. A. has always been a strong and influential body among the students. Its growth may be indicated by the fact that the organization was able in 1908 to erect a handsome building for its purposes at a cost of \$35,000, on the corner of Eleventh and Fremont streets, near the College grounds.

This building contains reading rooms, eighteen students' living rooms, a dining hall, and a gymnasium 42 x 70 feet, provided with lockers, baths, etc. The building with its conveniences is open free to all students, although a small fee of five dollars a year is charged for the use of the gymnasium and baths. One of the useful and practical features of the Y. M. C. A. is a students' employment bureau, which is maintained for the benefit of all students seeking employment. The religious work of the organization includes various courses for the study of the Bible and the work of Christian missions, which are maintained through the winter. The regular religious meetings of the association occur on Thursday evenings from 6:45 to 7:30, while occasional Sunday afternoon meetings are also held. Special meetings and receptions, which serve to broaden the acquaintanceship of the students and promote good-fellowship, are arranged from time to time. Especial attention is given the new students on and after their arrival, and assistance is rendered in securing rooms and boarding places for them. The association maintains a regular secretary, with whom prospective students are cordially encouraged to correspond. Address, General Secretary, Y. M. C. A., Kansas State Agricultural College, Manhattan, Kan.

YOUNG WOMEN'S CHRISTIAN ASSOCIATION

Similar in aim and purpose to the organization of the young men is the Young Women's Christian Association. The Y. W. C. A. home, at 905 Fremont street, is the permanent headquarters of the association, to which all young women of the College are at all times heartily welcome. An office for the secretary and a girls' rest room are also maintained during the College year on the first floor, southwest corner, of the Domestic Science and Art Building. The rooms at the College are open to visitors at any hour of the day and are attractively furnished with conveniences for rest and study.

At the association home, informal gatherings and entertainments lend variety and cheer to the life of the young women members and their friends.

An employment bureau for women students is maintained by the general secretary, without charge to its beneficiaries. Various committees are responsible for the lines of work of the association. One of the most practical of these is the investigation of cases of illness among the College girls, and the rendering of assistance when necessary. At the beginning of the College terms the incoming trains are met by a committee of girls wearing purple bows, by means of which they may easily

be recognized. This committee engages in assisting new women students in securing suitable lodging and boarding places.

During the College year various social functions are held for the benefit of the College women. The first of these is an informal reception, held on the first Friday following the opening of College, in order to enable the College girls to become better acquainted with one another. Once each year, in the winter term, the two associations entertain jointly.

The religious life of the Young Women's Association is fostered by weekly religious meetings, by courses in the study of the Bible, and in special Sunday services, for which outside speakers are often obtained. Courses for the study of mission work are also conducted.

#### THE NEWMAN CLUB

The Newman Club, an organization of Catholic students, holds a social meeting every other Friday evening, and on the alternate Friday evenings the time is devoted to some line of religious study under the direction of the local pastor. The College authorities recognize this Bible study by allowing a two-hour credit for it when properly certified. In further recognition of the club's efforts the College has placed a set of the new Catholic Encyclopedia on its library shelves. Furthermore, the club has purchased and placed in the College library nearly one-hundred dollars' worth of Catholic books and pamphlets.

The club is now on a sound basis and is qualifying for affiliation with a national organization of Newman clubs of the various state universities and colleges. Its aim is to favorably influence new Catholic students in the knowledge and practice of their faith, to foster sound morality and good character.

#### LITERARY AND SCIENTIFIC SOCIETIES

The literary societies of the College, eight in number, are wholly students' organizations, holding weekly meetings in the College buildings. The Alpha Beta and Franklin societies are open to both sexes; the Ionian, Eurodelphian, and Browning societies admit only young women to membership, while the Webster, Hamilton, and Athenian societies admit young men only. Students are encouraged to join one of these organizations for the sake of practice in the use of language, training in debate, and general experience in conducting meetings and in dealing with their fellows. These societies jointly maintain a debating council which coöperates with a Faculty committee in arranging for all inter-collegiate and interstate debates participated in by representatives of the College. The oratorical board, similarly maintained by these societies, arranges for the intersociety and intercollegiate oratorical contests.

#### THE SCIENCE CLUB

This is an organization of instructors and students for the promotion and advancement of science at the College. Membership is open to all persons interested in science. The meetings are held on the first Monday evening of each month in the lecture room of the Department of Chemistry in Physical Science Hall. All papers given at these meetings represent original work in science done at the institution. The program is further characterized by free discussion of the papers presented and by general scientific notes and news contributed by the members.



**AMERICAN INSTITUTE OF ELECTRICAL ENGINEERS**

This national organization of electrical engineers has a College branch, which holds its meetings on the first Tuesday evening of each month in the rooms of the Department of Electrical Engineering on the first floor of Physical Science Hall. At these meetings papers and discussions of professional interest are presented. Membership is confined to instructors and students in electrical engineering.

**THE AGRICULTURAL ASSOCIATION**

The Agricultural Association, composed of students especially interested in agricultural progress, holds meetings every two weeks, on Monday evening, in Fairchild Hall. This organization has steadily increased in numbers and interest until it is a potent and progressive factor in spreading the gospel of agricultural betterment.

**THE CADET CORPS**

Under the provisions of the Morrill act of 1862, under which the College was founded, instruction in military science and tactics is obligatory. Military science and drill are required of all men students in the freshman and sophomore years. This body of young men is formed into a cadet corps, organized into two battalions of infantry, under the command of a United States regular army officer in active service, temporarily detailed to this duty. The cadet corps is officered by upper classmen and constitutes a body under excellent discipline and training, and of attractive military bearing.

The uniforms are of the West Point pattern, and the insignia of rank are those of the United States infantry. The uniform is required to be worn while on military duty by all students subject to the drill regulations, and by reason of its neat appearance and serviceable character it is also quite frequently used by the under classmen for daily wear. Military discipline and training for a short time in a student's life has undoubted value in creating habits of obedience, neatness, and precision.

**THE COLLEGE BAND**

The College band is a military organization, composed of cadets assigned to this duty for the College year in lieu of drill and technical military instruction. The band is limited in its membership, and attendance of the members upon its exercises is obligatory. It has proved an effective aid to the cadet corps, stimulating a love for martial music, and affording an attractive feature of the various public ceremonial occasions at the College.

**THE COLLEGE ORCHESTRA**

The orchestra is a student organization connected with the Department of Music, membership in which is voluntary. Its daily training under competent leadership results in the acquisition of a considerable repertoire of musical compositions of the best quality. Those connected with the orchestra obtain in this way familiarity with the works of many of the great composers, and among the students at large the orchestra is an efficient aid in cultivating a taste for and an appreciation of good music.

## ATHLETIC ORGANIZATIONS

By means of the new gymnasium the College is now prepared to give complete physical as well as mental training. This building, which is equipped with all the usual accessories, assists in developing and maintaining physical tone and health in the student body. In addition to the gymnasium classes, and physical training in the military corps of cadets, all young men are encouraged to develop their physical skill by playing on practice teams in various athletic lines. In the fall, football teams are organized; in the fall and winter basketball; while in the spring baseball, tennis, and track athletics prevail. Every possible encouragement is given all students desirous of participating in these games to enter the practice teams and receive the necessary instruction. The most proficient of these have opportunity to enter the first teams and participate in intercollegiate contests. The College authorities encourage all reasonable and sane athletic development, as a means for the training of physical qualities desirable in men everywhere. Professionalizing tendencies are strictly repressed, and the athletic rules adopted by the Faculty prevent, by proper regulation, all participation in intercollegiate games on the part of students deficient in their studies.

The women students have equal opportunity for general physical training with the young men. In the gymnasium, under a physical director, they receive training suitable to their needs. Basketball and tennis teams are organized among the young women.

# LIST OF STUDENTS

## GRADUATE STUDENTS.

### CANDIDATES FOR MASTER'S DEGREE, 1914

- Nellie Aberle, B. S. 1912 (Kansas State Agricultural College), *English Language, English Literature*  
Manhattan, Riley county
- Roy Brown, D. V. M. 1911 (Iowa State College), *Bacteriology, Pathology, German*  
Belleville, Republic county
- Edwin Henry Hungerford, B. S. 1912 (Kansas State Agricultural College), *Chemistry, Bacteriology*  
Manhattan, Riley county
- Catherine Laura Justin, B. S. 1912 (Kansas State Agricultural College), *Home Economics*  
Manhattan, Riley county
- Venus Kimble, B. S. 1908 (Kansas State Agricultural College), *English Language, English Literature*  
Manhattan, Riley county
- Katherine Neale, B. S. 1909 (Ohio University), *Education, German*  
Manhattan, Riley county
- Edgar Allen Vaughn, B. S. 1912 (Kansas State Agricultural College), *Entomology, Zoölogy*  
Toronto, Woodson county
- Don Bion Whelan, B. S. 1910 (Hillsdale College), *Entomology, Zoölogy*  
Manhattan, Riley county

### OTHER GRADUATE STUDENTS

- Hattie Julia Abbott, B. S. 1913 (Kansas State Agricultural College), *Home Economics, Education*  
Manhattan, Riley county
- Elva Akin, B. S. 1905 (Kansas State Agricultural College), *Home Economics, Education*  
Manhattan, Riley county
- Walter Albert Buck, B. S. 1908 (Kansas State Agricultural College), *Engineering, Chemistry*  
Manhattan, Riley county
- Leland David Bushnell, B. S. 1905 (Michigan Agricultural College), *Chemistry*  
Manhattan, Riley county
- John Willard Calvin, B. S. 1906 (Kansas State Agricultural College), *Chemistry*  
Manhattan, Riley county
- Jane Mary Dow, B. S. 1911 (Kansas State Agricultural College), *English Language, Latin*  
Manhattan, Riley county
- Lelia Dunton, B. S. 1910, M. S. 1912 (Kansas State Agricultural College), *Chemistry*  
Manhattan, Riley county
- Oliver Archie Findley, B. S. 1911 (Kansas State Agricultural College), *Physics, Mathematics, Drawing*  
Manhattan, Riley county
- James Burger Fitch, B. S. 1910 (Purdue University), *Animal Nutrition*  
Manhattan, Riley county
- Carlotta Marks Ford, A. B. 1911 (University of Illinois), *Animal Nutrition*  
Geneva, Ill.
- Ivy Fuller, B. S. 1913 (Kansas State Agricultural College), *Education*  
Manhattan, Riley county
- Carrie May Gates, B. S. 1911 (Kansas State Agricultural College), *Home Economics*  
Asherville, Mitchell county
- Lura Gilmore, B. S. 1913 (Kansas State Agricultural College), *Education*  
Manhattan, Riley county
- Mrs. Marietta Gish, B. S. 1912 (Kansas State Agricultural College), *General Science*  
Manhattan, Riley county
- Edith Lois Givens, B. S. 1913 (Kansas State Agricultural College), *Education, History*  
Manhattan, Riley county
- Ethel Goheen, B. S. 1913 (Kansas State Agricultural College), *Education*  
Manhattan, Riley county
- Willis Larton Goldsmith, B. S. 1908 (Washburn), *Education*  
Manhattan, Riley county

- Frank Alfred Gougler, B. S. 1909 (Oklahoma Agricultural College), *Chemistry, Bacteriology, Soils, German*  
Manhattan, Riley county
- Frank Carl Gutsche, B. S. 1910 (University of Minnesota), *Chemistry*  
Manhattan, Riley county
- Helen Haines, B. S. 1913 (Kansas State Agricultural College), *Education*  
Manhattan, Riley county
- Clyde Carney Hamilton, B. S. 1913 (Kansas State Agricultural College), *Entomology, German*  
Holton, Jackson county
- Richard Harris, B. S. 1912 (Kansas State Agricultural College), *Architecture*  
Manhattan, Riley county
- Olive Wentworth Hartwell, B. S. 1913 (Kansas State Agricultural College), *Education, Domestic Art*  
Wichita, Sedgwick
- Elizabeth Hassebrock, B. S. 1909 (Kansas State Agricultural College), *English Language*  
Manhattan, Riley county
- William Hayes, B. S. 1913 (Kansas State Agricultural College), *Entomology, Animal Husbandry*  
Manhattan, Riley county
- Ida Viola Hepler, B. S. 1910 (Kansas State Agricultural College), *Bacteriology, English Language*  
Manhattan, Riley county
- Edith Antonette Holmberg, B. S. 1908 (Kansas State Agricultural College), *Chemistry, Home Economics*  
Manhattan, Riley county
- William Avery Hopper, B. S. 1910 (Kansas State Agricultural College), *Education, Mathematics*  
Manhattan, Riley county
- Josiah Simon Hughes, B. S. 1908 (Ohio State University), *Chemistry*  
Manhattan, Riley county
- John Grover Jackley, B. S. 1910 (University of Pennsylvania), *German*  
Manhattan, Riley county
- Ethel Justin, B. S. 1910 (Kansas State Agricultural College), *Chemistry, English, German*  
Manhattan, Riley county
- Herbert Hiram King, B. S. 1904 (Ewing College), *Chemistry*  
Manhattan, Riley county
- Lyman Dalton LaTourette, B. S. 1913 (University of Arizona), *Pathology, Entomology*  
Phoenix, Ariz.
- Vergie McCray, B. S. 1911 (Kansas State Agricultural College), *Education*  
Manhattan, Riley county
- Preston McCall, B. S. 1909 (Kansas State Agricultural College), *Chemistry, Soils*  
Manhattan, Riley county
- J. Henry Meyer, A. B. 1913 (Kansas Manual Training Normal School), *Chemistry, Soils*  
Girard, Crawford county
- Rolla Woods Miller, B. S. 1913 (Wabash College), *Chemistry*  
Manhattan, Riley county
- Margaret Morris, B. S. 1911 (Kansas State Agricultural College), *Music*  
Manhattan, Riley county
- Maria Morris, B. S. 1911 (Kansas State Agricultural College), *Music*  
Manhattan, Riley county
- Ray Murphy, B. S. 1912 (Illinois Wesleyan University), *Chemistry*  
Manhattan, Riley county
- Porter Joseph Newman, M. S. 1910 (Franklin College), *Chemistry*
- Floyd Pattison, B. S. 1912 (Kansas State Agricultural College), *Engineering*  
Herington, Dickinson county
- Clara Marguerite Peters, B. S. 1911 (Kansas State Agricultural College), *Home Economics*  
Manhattan, Riley county
- Charles Beryl Pitman, B. S. 1910 (Kansas State Agricultural College), *Chemistry, Education, Agronomy*  
Manhattan, Riley county
- Essie Blanch Schneider, B. S. 1912 (Kansas State Agricultural College), *Home Economics*  
Manhattan, Riley county
- Margaret Washburn Schultz, B. S. 1913 (Kansas State Agricultural College), *Education, Home Economics*  
Manhattan, Riley county
- Virginia Sherwood, B. S. 1912 (Kansas State Agricultural College), *Education, History*  
Manhattan, Riley county
- John Beardsley Sieglinger, B. S. 1913 (Oklahoma Agricultural College), *Chemistry, Soils, German*  
Lone Wolf, Okla.
- John Clifford Summers, B. S. 1906 (Clemson College, South Carolina), *Animal Nutrition, Grain Products*  
Manhattan, Riley county

## List of Students

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- Cassie Tanner, B. S. 1912 (Kansas State Agricultural College), *Education*  
     Manhattan, Riley county
- Chester Francis Turner, B. S. 1912 (Kansas State Agricultural College), *Entomology, Orcharding*  
     Manhattan, Riley county
- Marcia Elizabeth Turner, B. S. 1906 (Kansas State Agricultural College), *English Language, Home Economics*  
     Manhattan, Riley county
- Chester Allen Arthur Utt, B. S. 1903 (Cornell College), *Chemistry, Bacteriology*  
     Manhattan, Riley county
- Blanche Beatrice Vanderlip, B. S. 1910 (Kansas State Agricultural College), *Education, Live Stock*  
     Woodston, Rooks county
- Nellie Lunette Wreath, B. S. 1912 (Kansas State Agricultural College), *Education*  
     Manhattan, Riley county
- Katherine Zipse, B. S. 1913 (Kansas State Agricultural College), *History, English Language, German, Domestic Art*  
     Jewell City, Jewell county

## SENIORS

### AGRONOMY

Names	Post office (county or state)
Wilber Scott Acton, . . . . .	Ames, Cloud
Aaron E. Anderson, . . . . .	Eskridge, Wabaunsee
John Otto Barnes, . . . . .	Manhattan, Riley
Elmer Joseph Bird, . . . . .	Great Bend, Barton
Harry Clay Bird, . . . . .	Great Bend, Barton
Byron Ellsworth Blair, . . . . .	Pratt, Pratt
Frank Scott Blair, . . . . .	Blue Rapids, Marshall
Freeland Thomas Boise, . . . . .	Salt Lake City, Utah
Robert Kline Bonnett, . . . . .	Howard, Elk
Horace George Chittenden, . . . . .	Hays, Ellis
Alfred Lester Clapp, . . . . .	Fort Scott, Bourbon
Franklin Arthur Coffman, . . . . .	Lawrence, Douglas
Allan Park Davidson, . . . . .	Patapsco, Maryland
Ernest Doryland, . . . . .	Manhattan, Riley
Frank Leroy Fleming, . . . . .	Reading, Lyon
Victor Horner Florell, . . . . .	Jamestown, Cloud
Arthur Irving Gilkison, . . . . .	Hutchinson, Reno
Hiram Stanley Gish, . . . . .	Manhattan, Riley
William Ingles Gray, . . . . .	Jamestown, Cloud
Waldo Ernest Grimes, . . . . .	Greenwood, Missouri
Simpson Floyd Hacker, . . . . .	Atwood, Rawlins
Ralph Sams Hawkins, . . . . .	Marysville, Marshall
Herbert Lynne Hildwein, . . . . .	Hiawatha, Brown
Archie Loy Hodgson, . . . . .	Harveyville, Wabaunsee
Frank Robert Howe, . . . . .	Wymore, Nebraska
Robert Earl Karper, . . . . .	Chambersburg, Pennsylvania
Charles Park Lillard, . . . . .	Bloomington, Illinois
Milton Carl Lytle, . . . . .	Wellsville, Franklin
Clayton Alexander McIntosh, . . . . .	Palmer, Washington
Homer McNamara, . . . . .	Manhattan, Riley
Charles Ernest Millar, . . . . .	Manhattan, Riley
George Denton Miller, . . . . .	Horton, Brown
Paul LeRoy Mize, . . . . .	Wilder, Johnson
Edward May Parrish, . . . . .	Keytesville, Missouri
Charles Arthur Patterson, . . . . .	Manhattan, Riley
Aaron Ernest Pearson, . . . . .	Simpson, Mitchell
Stephen Lee Potter, . . . . .	Marshall, Missouri
Frank Lee Robinson, . . . . .	Atwood, Rawlins
Raymond Walter Schafer, . . . . .	Jewell, Jewell
Herman Henry Sherrard, . . . . .	Winfield, Cowley
Martin Ivin Shields, . . . . .	Lost Springs, Marion
Roy Harrison Van Scotk, . . . . .	Aulne, Marion
Lawrence Paul Wehrle, . . . . .	Scranton, Osage
Earl Joseph Willis, . . . . .	Manhattan, Riley
Vard Thomas Worstell, . . . . .	Bixby, Oklahoma

### ANIMAL HUSBANDRY

Claude Arbuthnot, . . . . .	Cuba, Republic
Lloyd Neil Arnold, . . . . .	Thomas, Oklahoma
Milton Henry Borst, . . . . .	Windom, Minnesota
Gilbert Lynn Cleland, . . . . .	Alma, Wabaunsee
Fred Raymond Dunlap, . . . . .	Eureka, Greenwood

## Kansas State Agricultural College

## SENIORS—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Verne Oren Farnsworth, . . . . .	North Topeka, Shawnee
Ward Stanley Gates, . . . . .	Asherville, Mitchell
Lloyd Wright Gearhart, . . . . .	Manhattan, Riley
David Gray, . . . . .	Topeka, Shawnee
Roy Elmer Gwin, . . . . .	Morrowville, Washington
Walter Andrew Hepler, . . . . .	Manhattan, Riley
Earl Henry Hostetler, . . . . .	Manhattan, Riley
Evan Liston Jenkins, . . . . .	White City, Morris
George DeRue Meiklejohn Jones, . . . . .	Kansas City, Missouri
Romney Carlyle Ketterman, . . . . .	Norman, Norton
Archer Franklin Kiser, . . . . .	Manhattan, Riley
Roy William Kiser, . . . . .	Manhattan, Riley
Karl Knaus, . . . . .	Benedict, Wilson
Frank Kramer, . . . . .	Zeandale, Riley
David Frier Laubmann, . . . . .	Russell, Russell
Carl Oscar Levine, . . . . .	Marysville, Marshall
L. Evermont McGinnis, . . . . .	Kansas City, Missouri
William Clifford Meldrum, . . . . .	Cedar Vale, Chautauqua
Claud F. Neerman, . . . . .	Cummings, Atchison
Frank Fletcher Root, . . . . .	Iola, Allen
Herman Frederick Tagge, . . . . .	New Holstein, Wisconsin
Leon Warden Taylor, . . . . .	Chapman, Dickinson
Oliver Taylor, . . . . .	Jefferson, Montgomery
Harry Millard Ziegler, . . . . .	Iola, Allen

## DAIRY HUSBANDRY

Harry Benjamin Allen, . . . . .	Goff, Nemaha
William Dennis Brigham, . . . . .	Burlington, Coffey
Ernest Herbert Clark, . . . . .	Linn, Washington
William Downs Cusic, . . . . .	Tecumseh, Shawnee
William Glenne Davis, . . . . .	Clay Center, Clay
Arthur Doryland, . . . . .	Manhattan, Riley
Cameron Schuyler Goldsmith, . . . . .	Abilene, Dickinson
Cecil Wick Haines, . . . . .	Manhattan, Riley
Ralph Hershey Musser, . . . . .	Abilene, Dickinson
Emmer Ivo Oshel, . . . . .	Gardner, Johnson
Roy Malcolm Phillips, . . . . .	Manhattan, Riley
Harry Charles Stockwell, . . . . .	Havensville, Pottawatomie

## HORTICULTURE

Lawrence William Anderson, . . . . .	Lincoln, Lincoln
William Renwick Curry, . . . . .	Dunavant, Jefferson
John Fuller Davidson, . . . . .	Wichita, Sedgwick
Benjamin Ray Ellis, . . . . .	Pleasanton, Linn
Harold Clare Gaden, . . . . .	Riley, Riley
Robert Benjamin Hood, . . . . .	Hutchinson, Reno
Clarence Roy Jaccard, . . . . .	Webb City, Missouri
James Donald McCallum, . . . . .	Kansas City, Wyandotte
Ernest Grover Shaad, . . . . .	Lawrence, Douglas
Thomas Garfield Spring, . . . . .	Greensburg, Kiowa
William Leander Sweet, . . . . .	Manhattan, Riley
Horace Theodore Wilkie, . . . . .	Topeka, Shawnee

## VETERINARY MEDICINE

Hans William Broberg, . . . . .	Lincoln, Lincoln
Jesse Jonathan Frey, . . . . .	Manhattan, Riley
George Frederick Haas, . . . . .	Baldwin, Douglas
Thomas Powell Haslam, . . . . .	Manhattan, Riley
Lucian Eastman Hobbs, . . . . .	Manhattan, Riley
Raymond Roger Houser, . . . . .	Grainfield, Gove
Leland Allison Howell, . . . . .	North Topeka, Shawnee
Aldie Philip Immenschuh, . . . . .	Manhattan, Riley
Ellis Wesley Kern, . . . . .	Kirwin, Phillips
Edward Kernohan, . . . . .	Nashville, Kingman
Gustav Herman Mydland, . . . . .	Manhattan, Riley
Roscoe Damron Parrish, . . . . .	Johnston City, Illinois
Deles George Tepfer, . . . . .	Wichita, Sedgwick

## ARCHITECTURE

Samuel Hiram Crottinger, . . . . .	Manhattan, Riley
Earl Philip Friedline, . . . . .	Alden, Rice
Harold Thomas English, . . . . .	Hutchinson, Reno
Carl Olans Johnson, . . . . .	Clay Center, Clay
Warren Arthur Rude, . . . . .	Hoisington, Barton
Floyd Alonzo Smutz, . . . . .	Bird City, Cheyenne
Russell Barr Williamson, . . . . .	Princeton, Franklin

## List of Students

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### SENIORS—continued.

#### CIVIL ENGINEERING

Names	Post office (county or state)
George Wallace Alexander, . . . . .	Atchison, Atchison
Arvid Anton Anderson, . . . . .	Lindsborg, McPherson
Arthur Gilbert Beckman, . . . . .	Lindsborg, McPherson
Willis Edwin Comfort, . . . . .	Manhattan, Riley
Arthur Harold Gilles, . . . . .	Kansas City, Wyandotte
John Gist, . . . . .	Manhattan, Riley
Melvin Earnest Hartzler, . . . . .	Goodland, Sherman
Victor Guy Hendrickson, . . . . .	Manhattan, Riley
George Barney Hickok, . . . . .	Wichita, Sedgwick
John Selwyn McBride, . . . . .	Mankato, Jewell
Ralph Denny Rhodes, . . . . .	Gage, <i>Oklahoma</i>
Benjamin Scalapino, . . . . .	Everest, Brown
Charles Henry Scholer, . . . . .	Milo, Lincoln
Ulysses Jay Smith, . . . . .	Manhattan, Riley
Harold Ainsworth Thackrey, . . . . .	Kansas City, Wyandotte
George Edwin Werner, . . . . .	Linn, Washington
Gerald Wyland, . . . . .	Smith Center, Smith

#### ELECTRICAL ENGINEERING

Harry Everett Butcher, . . . . .	Solomon, Dickinson
Harold Goble, . . . . .	Riley, Riley
Lawrence Gaylord Gross, . . . . .	Manhattan, Riley
Peter John Charles Klaumann, . . . . .	Belleville, Republic
Lawrence Archibald O'Brien, . . . . .	Luray, Marshall
Frank Sidorfsky, . . . . .	Leroy, Coffey
William Ross Smith, . . . . .	Peabody, Marion
Charles Dayton Strain, . . . . .	Phillipsburg, Phillips

#### MECHANICAL ENGINEERING

George Baird, . . . . .	Valencia, Shawnee
Noble Max Hutchinson, . . . . .	Coalinga, <i>California</i>
George Selick Knapp, . . . . .	Manhattan, Riley
James Francis Moss, . . . . .	Eureka, Greenwood
Roy Reno Myers, . . . . .	Manhattan, Riley
Robert Johnson Taylor, . . . . .	Manhattan, Riley
Victor Whiteside, . . . . .	Wichita, Sedgwick
Joseph Roy Witmer, . . . . .	Sabetha, Nemaha
James Howard Young, . . . . .	Kansas City, Wyandotte
Roy Norton Young, . . . . .	Beloit, Mitchell

#### HOME ECONOMICS

Katherine Maurine Adams, . . . . .	Manhattan, Riley
Lulu Emma LouCena Albers, . . . . .	Nekoma, Rush
Eva Alleman, . . . . .	Kansas City, Wyandotte
Myra Amsden, . . . . .	Manhattan, Riley
Elsie Katryn Arbuthnot, . . . . .	Cuba, Republic
Madeline Baird, . . . . .	Manhattan, Riley
Lillian Clara Williams Baker, . . . . .	Topeka, Shawnee
Ethel May Balmer, . . . . .	Hiawatha, Brown
Margaret Ann Blanchard, . . . . .	Manhattan, Riley
Esther Hulda Boell, . . . . .	Riley, Riley
Ethel Marie Boyce, . . . . .	Kansas City, Wyandotte
Mary Kathryn Boyle, . . . . .	Chillicothe, <i>Missouri</i>
Ethel Louise Brown, . . . . .	Hutchinson, Reno
Jennie Mabel Brown, . . . . .	Plainsville, Rooks
Jessie Mabel Brown, . . . . .	Ellsworth, Ellsworth
Elma Brubaker, . . . . .	Edwardsville, Wyandotte
Dorothy Jo Buschow, . . . . .	Colby, Thomas
(Mrs.) Ida Rose Carlson, . . . . .	Manhattan, Riley
Mary Alice Canfield, . . . . .	Belleville, Republic
Cecyl DeLois Carter, . . . . .	Lawrence, Douglas
Francis Mildred Caton, . . . . .	Concordia, Cloud
Ella Rebecca Chitty, . . . . .	Manhattan, Riley
Ida Fra Clark, . . . . .	Colony, Anderson
Mae Clark, . . . . .	Eskridge, Wabaunsee
Edna Florence Coith, . . . . .	Manhattan, Riley
Anna Laura Cornick, . . . . .	Topeka, Shawnee
Elizabeth Anna Cox, . . . . .	Goodrich, Linn
Grace Lucile Craven, . . . . .	Manhattan, Riley
Pearl Artena Cross, . . . . .	Wichita, Sedgwick
Mary Dahl, . . . . .	Montrose, Jewell
Nora Dahl, . . . . .	Montrose, Jewell
Edna May Danner, . . . . .	Topeka, Shawnee
Flossie Edyth Davis, . . . . .	Plevna, Reno
Josephine Woodward Doran, . . . . .	Topeka, Shawnee

## SENIORS—continued

<i>Names</i>	<i>Post office (county or state)</i>
Mary Fay Elliott, . . . . .	Dell Rapids, <i>South Dakota</i>
(Mrs.) Nellie Ferrin Ely, . . . . .	Coldwater, <i>Comanche</i>
Mina Erickson, . . . . .	Manhattan, <i>Riley</i>
Elsie May Ester, . . . . .	Peck, <i>Sedgwick</i>
Helen Mary Evans, . . . . .	Decatur, <i>Indiana</i>
Edith Elizabeth Folz, . . . . .	Marysville, <i>Marshall</i>
Lena Fossler, . . . . .	Manhattan, <i>Riley</i>
Olive Ruth Gage, . . . . .	La Cygne, <i>Linn</i>
Grace Ethel Garvie, . . . . .	Abilene, <i>Dickinson</i>
Ruth Elizabeth Gilbert, . . . . .	Wichita, <i>Sedgwick</i>
Edith Sara Glascock, . . . . .	Kansas City, <i>Wyandotte</i>
Mabel Lucile Glenn, . . . . .	Minneapolis, <i>Ottawa</i>
Alma Grace Halbower, . . . . .	Anthony, <i>Harper</i>
Alta Marie Handlin, . . . . .	Manhattan, <i>Riley</i>
Bessie Lourene Hardman, . . . . .	Commerce, <i>Georgia</i>
Vida Agnes Harris, . . . . .	Manhattan, <i>Riley</i>
Rembert Lydia Harshbarger, . . . . .	Manhattan, <i>Riley</i>
Lola Garnett Hartwell, . . . . .	Frankfort, <i>Marshall</i>
Nola May Hawthorne, . . . . .	Gypsum, <i>Saline</i>
Mae Virginia Hildebrand, . . . . .	Manhattan, <i>Riley</i>
Helen Marie Hockersmith, . . . . .	Manhattan, <i>Riley</i>
Bessie Ursula Hoffman, . . . . .	Enterprise, <i>Dickinson</i>
Mary Hoover, . . . . .	Manhattan, <i>Riley</i>
Helen Marguerite Hornaday, . . . . .	Lawrence, <i>Douglas</i>
Nora Melissa Hoti, . . . . .	Hiawatha, <i>Brown</i>
Ethel Margaret Hotte, . . . . .	Manhattan, <i>Riley</i>
Jeanetta James, . . . . .	Joplin, <i>Missouri</i>
Gladys May Johnson, . . . . .	Manhattan, <i>Riley</i>
Margaret Florence Jones, . . . . .	Barret, <i>Labette</i>
Gladys Elsie Kirchner, . . . . .	Burlingame, <i>Osage</i>
Alice Irene Kiser, . . . . .	Manhattan, <i>Riley</i>
Vera Belle Kizer, . . . . .	Manhattan, <i>Riley</i>
Mary Lemon, . . . . .	Plainville, <i>Rooks</i>
Hazel Viola Limbocker, . . . . .	Manhattan, <i>Riley</i>
Lillie Edna Lundberg, . . . . .	Manhattan, <i>Riley</i>
Helen Pearl McClanahan, . . . . .	Manhattan, <i>Riley</i>
Mary Emma McCluskey, . . . . .	Junction City, <i>Geary</i>
(Mrs.) Maude Eveline McCulloch, . . . . .	Manhattan, <i>Riley</i>
Elvira Miriam McKee, . . . . .	Manhattan, <i>Riley</i>
Mary Elizabeth McNamara, . . . . .	Manhattan, <i>Riley</i>
Sephia Elizabeth Maelzer, . . . . .	Centralia, <i>Nemaha</i>
Anna Malm, . . . . .	Manhattan, <i>Riley</i>
Maud Marshall, . . . . .	Manhattan, <i>Riley</i>
Golda Estella Masters, . . . . .	Manhattan, <i>Riley</i>
Edith Maude Maxwell, . . . . .	Topeka, <i>Shawnee</i>
Gertrude Helen Miller, . . . . .	Manhattan, <i>Riley</i>
Emily June Milner, . . . . .	Hartford, <i>Lyon</i>
Flora Seraphine Monroe, . . . . .	Ottawa, <i>Franklin</i>
Margaret Ellenor Moore, . . . . .	Manhattan, <i>Riley</i>
Jessie Elizabeth Neiman, . . . . .	White Water, <i>Butler</i>
Mary Eleanor Neiman, . . . . .	White Water, <i>Butler</i>
Prudence Eileen Neiswender, . . . . .	North Topeka, <i>Shawnee</i>
Winifred Louise Neusbaum, . . . . .	Manhattan, <i>Riley</i>
Ethel Blanch Niver, . . . . .	Inman, <i>McPherson</i>
Mary Nixon, . . . . .	Manhattan, <i>Riley</i>
Ida May Northrop, . . . . .	San Gabriel, <i>California</i>
Genevieve Alice Nowlin, . . . . .	Kansas City, <i>Missouri</i>
Martha Lois Noyes, . . . . .	Manhattan, <i>Riley</i>
Nellie May Olson, . . . . .	Harveyville, <i>Wabaunsee</i>
Lois Fae Paddock, . . . . .	Manhattan, <i>Riley</i>
Izil Isabella Polson, . . . . .	Fredonia, <i>Wilson</i>
Mabel Grace Powell, . . . . .	Manhattan, <i>Riley</i>
Anna Lottie Pratt, . . . . .	Burlingame, <i>Osage</i>
Ethelyn Pearl Pray, . . . . .	Manhattan, <i>Riley</i>
Maggie Price, . . . . .	Manhattan, <i>Riley</i>
Alta Coy Roberts, . . . . .	Morill, <i>Brown</i>
Ethel Bruce Roseberry, . . . . .	Arkansas City, <i>Cowley</i>
Mary Susan Rowan, . . . . .	Arkansas City, <i>Cowley</i>
Verna May Rumble, . . . . .	Moran, <i>Allen</i>
Clara Louise Sachau, . . . . .	Manhattan, <i>Riley</i>
Anna Elizabeth Sanders, . . . . .	Manhattan, <i>Riley</i>
Amy Inez Savage, . . . . .	Miltonvale, <i>Cloud</i>
Eda Lillian Schowalter, . . . . .	Halstead, <i>Harvey</i>
Bertha Ruegg Schwab, . . . . .	Clifton, <i>Washington</i>
Eva Leona Sharpe, . . . . .	Chase, <i>Rice</i>
Bessie Laura Sheaff, . . . . .	Kansas City, <i>Wyandotte</i>
Hazel Shellenberger, . . . . .	Westboro, <i>Missouri</i>
Anna Maude Smith, . . . . .	Lyons, <i>Rice</i>
Twyliah Opal Springer, . . . . .	Tulsa, <i>Oklahoma</i>



# *List of Students*

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## SENIORS—continued

<i>Names</i>	<i>Post office (county or state)</i>
Anna Steckelberg, . . . . .	Manhattan, Riley
Mary Kathryn Sterrenberg, . . . . .	Manhattan, Riley
Lola Dow Stoddard, . . . . .	Manhattan, Riley
Mary Dow Stoddard, . . . . .	Manhattan, Riley
May Leigh Symonds, . . . . .	Peabody, Marion
Murrel Myra Sweet, . . . . .	Manhattan, Riley
Gail Tatman, . . . . .	Manhattan, Riley
Cora Tempero, . . . . .	Clay Center, Clay
Emma Atwood Tomlinson, . . . . .	Topeka, Shawnee
Bernice Truesdell, . . . . .	Lyons, Rice
Bertha Truesdell, . . . . .	Lyons, Rice
Verna May Vanderlip, . . . . .	Woodston, Rooks
Margaret Esther Walbr, . . . . .	Russell, Russell
Bessie Blanche Walsh, . . . . .	Clay Center, Clay
Nellie Marie Wartenbee, . . . . .	Liberal, Seward
Lillian Caroline Weeks, . . . . .	Vermillion, Marshall
Amelia Ursula Wheeler, . . . . .	Manhattan, Riley
Margaret Lee Whitney, . . . . .	Topeka, Shawnee
Gladys Wilcox, . . . . .	Dwight, Morris
Beulah Wingfield, . . . . .	Dwight, Morris
Laura Wingfield, . . . . .	Dwight, Morris
Ada Worley, . . . . .	Paradise, Russell

## GENERAL SCIENCE

Jesse Bliss Adams, . . . . .	Mound City, Linn
John William Allen, . . . . .	Norwich, Kingman
John Gordon Auld, . . . . .	Manhattan, Riley
Harry Charles Baird, . . . . .	Kensington, Smith
Julia Margaret Baker, . . . . .	Cherryvale, Montgomery
Albert William Bellomy, . . . . .	Manhattan, Riley
Charles Fay Buck, . . . . .	Oskaloosa, Jefferson
Lois Blanche Burt, . . . . .	Wabaunsee, Wabaunsee
Carl Balfour Butler, . . . . .	Manhattan, Riley
Leslie Irl Collins, . . . . .	Manhattan, Riley
Clara Affadilla Deaver, . . . . .	Sebetha, Nemaha
Henry Owen Dresser, . . . . .	Manhattan, Riley
Mina Louisa Dyer, . . . . .	Riley, Riley
Thomas Joseph Harris, . . . . .	Howard, Elk
Ruth Isabel Hughes, . . . . .	Topeka, Shawnee
John Luther Hutchinson, . . . . .	Lincoln, Lincoln
James Walter Johansen, . . . . .	Hays, Ellis
Frederick Herbert Loomis, . . . . .	Alton, Osborne
John Lund, . . . . .	Manhattan, Riley
Mary Belle Lunden, . . . . .	Salina, Saline
John Michael Lyons, . . . . .	Manhattan, Riley
Ethel Marshall, . . . . .	Manhattan, Riley
William Joseph Marshall, . . . . .	Manhattan, Riley
Alexander Bradford Morgan, . . . . .	Leon, Butler
Junior Bowler Mudge, . . . . .	Manhattan, Riley
Kathrina Munger, . . . . .	Manhattan, Riley
Mary Nichols, . . . . .	Nortonville, Jefferson
Minne Beryl Pence, . . . . .	Dunavant, Jefferson
George Hemrod Railsback, . . . . .	Manhattan, Riley
Nellie Evelyn Reed, . . . . .	Havensville, Pottawatomie
John Lee Robinson, . . . . .	Hays, Ellis
Martin William Souders, . . . . .	Manhattan, Riley
Joe Vale, . . . . .	Webber, Jewell
Hannah Amelia Wetzig, . . . . .	Manhattan, Riley
Clyde George Winter, . . . . .	Dover, Shawnee

## INDUSTRIAL JOURNALISM

Lucile Rebecca Berry, . . . . .	Jewell, Jewell
Vinton Virgil Detwiler, . . . . .	Jewell, Jewell
Dwight Logan Miller, . . . . .	Manhattan, Riley
William Allison Sumner, . . . . .	Manhattan, Riley

## JUNIORS

## AGRONOMY

<i>Names</i>	<i>Post office (county or state)</i>
John Joseph Bayles, . . . . .	Manhattan, Riley
Fred Miles Bealey, . . . . .	Morrill, Brown
Samuel Lynton Brookover, . . . . .	Eureka, Greenwood
Percy Walter Cockerill, . . . . .	Manhattan, Riley
William Bayles Coffman, . . . . .	Manhattan, Riley
Ralph Cleland Erskine, . . . . .	Edgerton, Johnson
Luzerne Fairchild, . . . . .	Manhattan, Riley
Robert Everett Freeto, . . . . .	Cheney, Sedgwick
Charles William Gartrell, . . . . .	Kansas City, <i>Missouri</i>
Roy Hagans, . . . . .	Utica, Ness
Frank Haucke, . . . . .	Council Grove, Morris
Herbert Henley Haymaker, . . . . .	Wichita, Sedgwick
John Vern Hepler, . . . . .	Manhattan, Riley
John Hungerford, . . . . .	Manhattan, Riley
Don Louis Irwin, . . . . .	Winfield, Cowley
James Lawrence Jacobson, . . . . .	Waterville, Marshall
Floyd William Johnson, . . . . .	Downs, Osborne
Amwel Edwin Jones, . . . . .	Manhattan, Riley
Foo Kau Lee, . . . . .	Honolulu, <i>H. I.</i>
Marc Lindsay, . . . . .	Kansas City, Wyandotte
Charles Gardiner Lyon, . . . . .	Emporia, Lyon
James Marshall McArthur, . . . . .	Walton, Harvey
Guy Everett McCarthy, . . . . .	Manhattan, Riley
Arthur Erskine McClymonds, . . . . .	Walton, Harvey
James Myron McCray, . . . . .	Manhattan, Riley
Chester Howard Middleton, . . . . .	Manhattan, Riley
Fred Weymouth Milner, . . . . .	Hartford, Lyon
Raymond Jack Montgomery, . . . . .	Topeka, Shawnee
Lawrence Maston Nabours, . . . . .	Manhattan, Riley
Edward Quinsby Perry, . . . . .	Manhattan, Riley
Joseph Heber Pierce, . . . . .	Fredonia, Wilson
Percival Button Potter, . . . . .	Manhattan, Riley
Edward Russell, . . . . .	McPherson, McPherson
Wilbur Nelsen Skourup, . . . . .	Colony, Anderson
William Burton Smith, . . . . .	Wellsville, Franklin
John William Stockebrand, . . . . .	Vernon, Woodson
Elbert Edward Thompson, . . . . .	Horton, Brown
Julius Patterson Van Vleit, . . . . .	Manhattan, Riley
George Isidore Walsh, . . . . .	Manhattan, Riley
John Hanna Welsh, . . . . .	Kansas City, <i>Missouri</i>
George Washington Williams, . . . . .	Bigelow, Marshall
William Wayne Willis, . . . . .	Emporia, Lyon
John Barton Wise, . . . . .	Clearwater, Sedgwick
Willits Reeve Worthington, . . . . .	Manhattan, Riley

## ANIMAL HUSBANDRY

Glenn Allen, . . . . .	Lawrence, Douglas
George Edgar Anderson, . . . . .	Manhattan, Riley
George Harold Ansdell, . . . . .	Jamestown, Cloud
Keatley Graham Baker, . . . . .	Manhattan, Riley
George Herbert Bunnell, . . . . .	Iola, Allen
Arthur Burkholder, . . . . .	Marion, Marion
Henry Samuel Collins, . . . . .	Manhattan, Riley
Harold Clay Ewers, . . . . .	Topeka, Shawnee
Joe Myron Goodwin, . . . . .	Asherville, Mitchell
Merrill Lenord Gould, . . . . .	Jamestown, Cloud
Oscar LeRoy Johnson, . . . . .	Mead, <i>Nebraska</i>
Lafayette Poindexter Jones, . . . . .	Carlsbad, <i>New Mexico</i>
Ernest Lawson, . . . . .	Mankato, Jewell
Fred Morris Layton, . . . . .	Blue Rapids, Marshall
Paul Loomis, . . . . .	Manhattan, Riley
Harry Strawn Loyd, . . . . .	Wichita, Sedgwick
Jay Lawrence Lush, . . . . .	Altamont, Labette
Clinton Fish McIlrath, . . . . .	Kingman, Kingman
Wallace McIlrath, . . . . .	Manhattan, Riley
Lorenzo Beckley Mann, . . . . .	Manhattan, Riley
William O'Connell, . . . . .	Kiowa, Barber
Raymond Smith Orr, . . . . .	Manhattan, Riley
Will Edward Palmer, . . . . .	Hays, Ellis
Wray Robert Reeves, . . . . .	Manhattan, Riley
Richard Jerome Sedivy, . . . . .	Blue Rapids, Marshall
Bryon John Taylor, . . . . .	Chapman, Dickinson
Fred Martin Taylor, . . . . .	Formoso, Jewell
Ralph Waldo Taylor, . . . . .	Sedgwick, Harvey
Walter Edward Tudor, . . . . .	Holton, Jackson
Wilmer Homer Wilson, . . . . .	Osage City, Osage

## List of Students

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### JUNIORS—continued.

#### DAIRY HUSBANDRY

Names	Post office (county or state)
Albert William Aicher, . . . . .	Manhattan, Riley
Otto Lincoln Hubb, . . . . .	Mexico City, <i>Mexico</i>
James Walton Linn, . . . . .	Manhattan, Riley
William Symington Morrow, . . . . .	Kansas City, Wyandotte
Victor Fred Stuewe, . . . . .	Alma, Wabaunsee
Graydon Tilbury, . . . . .	Arkansas City, Cowley
Francis Marion Wadley, . . . . .	Kansas City, Wyandotte
Harry Homer Wilson, . . . . .	Silver Lake, Shawnee

#### HORTICULTURE

Fred Collins Browne, . . . . .	Burdett, Pawnee
Anson Lane Ford, . . . . .	Manhattan, Riley
Louie Loraine Horr, . . . . .	Lawrence, Douglas
Glenn Henderson Lawyer, . . . . .	Iola, Allen
James Ralph Little, . . . . .	Topeka, Shawnee
Archie Lee Marble, . . . . .	Esbon, Jewell
David Riley Shull, . . . . .	Kansas City, Wyandotte
William Taylor, . . . . .	Mexico City, <i>Mexico</i>
Walter Harris Washington, . . . . .	Manhattan, Riley

#### VETERINARY MEDICINE

Merrill Ellsworth Agnew, . . . . .	Smith Center, Smith
William Albert Bright, . . . . .	Plainville, Rocks
Lawrence Vernon Cummings, . . . . .	Wichita, Sedgwick
George Holland Dean, . . . . .	Arkansas City, Cowley
Ira Loren Fowler, . . . . .	Manhattan, Riley
William Arthur Hagan, . . . . .	Manhattan, Riley
Paul King, . . . . .	Potwin, Butler
William Clarence McConnell, . . . . .	Downs, Osborne
Zara Harmon McDonnell, . . . . .	Goff, Nemaha
John William Meyer, . . . . .	Chapman, Dickinson
William James Scanlan, . . . . .	Chapman, Dickinson
Cameron Mac Smith, . . . . .	Wakefield, Clay
Tom Toothaker, . . . . .	Manhattan, Riley
Richard Thomas Wilson, . . . . .	Manhattan, Riley

#### ARCHITECTURE

Stanley Baker, . . . . .	Manhattan, Riley
George Wilson Christie, . . . . .	Manhattan, Riley
Lester Lawrence Howenstine, . . . . .	Manhattan, Riley
Harold Lester Hurtt, . . . . .	Wichita, Sedgwick
Robert Edwin Sellers, . . . . .	Emporia, Lyon
Charles William Shaver, . . . . .	Lincoln, Lincoln
Elmer Warren Wilson, . . . . .	Kansas City, Wyandotte

#### CIVIL ENGINEERING

Frank Harmon Freeto, . . . . .	Cheney, Sedgwick
George Arthur Hopp, . . . . .	Manhattan, Riley
Ralph Jones, . . . . .	Cottonwood Falls, Chase
Wayne Ramage, . . . . .	Arkansas City, Cowley
Guy Allegre Russell, . . . . .	Lakin, Kearny
Francis Lewelling Shull, . . . . .	Manhattan, Riley

#### ELECTRICAL ENGINEERING

Charles Andros Barrows, . . . . .	Atchison, Atchison
James Edgar Alsop, . . . . .	Wakefield, Clay
Chancellor Lee Archer, . . . . .	Glasco, Cloud
Ralph Gahan Baker, . . . . .	Malta Bend, <i>Missouri</i>
Henry Brown, . . . . .	Mont Ida, Anderson
Nelson Harry Davis, . . . . .	Delavan, Morris
George Louis Farmer, . . . . .	Wichita, Sedgwick
Shelby Glasgow Fell, . . . . .	Haviland, Kiowa
Lawrence Vale Fickel, . . . . .	Manhattan, Riley
Gerald Laurence Fitzgerald, . . . . .	Colby, Thomas
Louis Charles Geisendorf, . . . . .	Clearwater, Sedgwick
Maynard Goudy, . . . . .	Waverly, Coffey
Calvin Andrew Hooker, . . . . .	Tyro, Montgomery
Paul Edward Jackson, . . . . .	Downs, Osborne
Foo Yuen Lim, . . . . .	Canton, <i>China</i>
Willard Jackson Loomis, . . . . .	Colby, Thomas
Frank Archer Moore, . . . . .	Tribune, Greeley
Homer Earl Newhouse, . . . . .	Lane, Franklin
Arthur Nichols, . . . . .	Manhattan, Riley
Milo Albert Nicholson, . . . . .	Spring Hill, Jefferson

## JUNIORS—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Lewis Reynolds Parkerson, . . . . .	Manhattan, Riley
Lloyd Reudy, . . . . .	Dodge City, Ford
Paul Cotter Ringwalt, . . . . .	Oakley, Logan
Gilbert Haven Sechrist, . . . . .	Meriden, Jefferson
Corwin Crittenden Smith, . . . . .	Manhattan, Riley
Eugene Shapley Smith, . . . . .	Pittsburg, Crawford
John Thompson Steele, jr., . . . . .	Manhattan, Riley
John Walter Stockebrand, . . . . .	Vernon, Woodson
Leland Ray Varcoe, . . . . .	Wilsey, Morris

## MECHANICAL ENGINEERING

Joel Emanuel Bengston, . . . . .	Lindsborg, McPherson
Chester Arthur Carter, . . . . .	Garden City, Finney
Bruce Henry Cummings, . . . . .	Richland, Shawnee
Arthur Douglas, . . . . .	Manhattan, Riley
Nicholas Fritz Enns, . . . . .	Inman, McPherson
Albert Hilery Ganshird, . . . . .	Manhattan, Riley
Charles Wallace Giffin, . . . . .	Paola, Miami
William Witt Haggard, . . . . .	Topeka, Shawnee
George Hamilton, . . . . .	Manhattan, Riley
George Mawhirter, . . . . .	Wakarusa, Shawnee
John Irl Michaels, . . . . .	Osawatomie, Miami
John Dwight Parsons, . . . . .	Arkansas City, Cowley
William Leon Rhoades, . . . . .	Pleasanton, Linn
Ralph Allen Shelly, . . . . .	Atchison, Atchison
Francis Eugene Sullivan, . . . . .	Greeley, Anderson
Roy Leander Swenson, . . . . .	Lindsborg, McPherson
Frank Vincent, . . . . .	Kansas City, Wyandotte
Harold Adlia Wagner, . . . . .	Manhattan, Riley
Carl Walter Wyland, . . . . .	Harlan, Smith

## HOME ECONOMICS

Ruth Harriet Aiman, . . . . .	Manhattan, Riley
Maurine Dorothy Allison, . . . . .	McPherson, McPherson
Ruth Arbuthnot, . . . . .	Belleville, Republic
Dulce Atkins, . . . . .	Manhattan, Riley
Agnes Lenora Baird, . . . . .	Kansas City, Missouri
Elsie Loretta Baird, . . . . .	Cherryvale, Montgomery
Bertha Fern Baker, . . . . .	Narka, Republic
Florence Annie Baker, . . . . .	Kansas City, Wyandotte
Edna Frances Barber, . . . . .	Manhattan, Riley
Grace Adeline Barker, . . . . .	Newton, Harvey
Lillian Elsie Barnum, . . . . .	Simpson, Cloud
Cleo Lucile Beall, . . . . .	San Marcos, Texas
Edith Nell Beaubien, . . . . .	Dodge City, Ford
Mabel Bennett, . . . . .	Manhattan, Riley
Clara Louise Blair, . . . . .	Mulvane, Sumner
Dorothy Blazer, . . . . .	Wichita, Sedgwick
Ruby Edna Blomquist, . . . . .	Kansas City, Wyandotte
Myrtle Pearl Blythe, . . . . .	White City, Morris
Marie Anita Boyle, . . . . .	Spivey, Kingman
Ena Bess Brown, . . . . .	Manhattan, Riley
Minnie Ruth Brown, . . . . .	Kansas City, Wyandotte
D'Elsie Bryan, . . . . .	Wichita, Sedgwick
Elsie Luella Buchheim, . . . . .	Winkler, Riley
Eliza Burkdoll, . . . . .	Ottawa, Franklin
Effe May Carp, . . . . .	Wichita, Sedgwick
Ethel Esther Cary, . . . . .	Manhattan, Riley
Mary Rosena Churchward, . . . . .	Wichita, Sedgwick
Pauline Frances Clarke, . . . . .	Paola, Miami
Minerva Clare Cooper, . . . . .	Pendennis, Lane
Mary Margaret Courter, . . . . .	Topeka, Shawnee
Verral Janice Craven, . . . . .	Erie, Neosho
Juanita Davis, . . . . .	Cottonwood Falls, Chase
Myrtle DeFever, . . . . .	Fall River, Greenwood
Elizabeth Dempewolf, . . . . .	Frankfort, Marshall
Mary Virginia Dodd, . . . . .	Langdon, Reno
Valeda Edith Downing, . . . . .	Stafford, Stafford
Mary Rebecca Dunlap, . . . . .	Eureka, Greenwood
Marguerite Elliott, . . . . .	Manhattan, Riley
Emma Evalixe Evans, . . . . .	Liberal, Seward
Laura Belle Falkenrich, . . . . .	Manhattan, Riley
Louise Fielding, . . . . .	Manhattan, Riley
Elizabeth Fitzgerald, . . . . .	Roswell, New Mexico
Marion Rosina Fowler, . . . . .	Brookville, Saline
Erma Lea Fox, . . . . .	Larned, Pawnee
Velora Augusta Fry, . . . . .	Manhattan, Riley
Carrie Belle Gardner, . . . . .	Newton, Harvey

# List of Students

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## JUNIORS—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Mary Ellen Glenn, . . . . .	Waverly, Coffey
Amy Pearl Gould, . . . . .	Manhattan, Riley
Louise Greenman, . . . . .	Kansas City, Wyandotte
Edythe Seanert Groome, . . . . .	Manhattan, Riley
Minnie Agnes Gugenhan, . . . . .	May Day, Riley
Mary Gurnea, . . . . .	Belleville, Republic
Daisy Arminta Hall, . . . . .	Speed, Phillips
Drusilla Edith Halleck, . . . . .	Abilene, Dickinson
Esther Jane Hamerli, . . . . .	Oak Hill, Clay
Carrie Miller Harper, . . . . .	Wichita, Sedgwick
Elsie Cathrine Hellwig, . . . . .	Oswego, Labette
Vivian Herron, . . . . .	Topeka, Shawnee
Ruth Lucile Hill, . . . . .	Wichita, Sedgwick
Mildred Hollingsworth, . . . . .	Lincoln, Lincoln
Louise Jacobs, . . . . .	Council Grove, Morris
Grace Florence Kasermann, . . . . .	Topeka, Shawnee
Crystal Helene Kelley, . . . . .	Yates Center, Woodson
Mabel Beatrice Kessler, . . . . .	Wichita, Sedgwick
Mary Jo Kimball, . . . . .	Manhattan, Riley
Grace May King, . . . . .	Burlington, Coffey
Ida Jane Kingan, . . . . .	Topeka, Shawnee
(Mrs.) Flora Einsel Kirk, . . . . .	Manhattan, Riley
Katharine Mermet Laing, . . . . .	Manhattan, Riley
Lillian Antoinette Lathrop, . . . . .	Manhattan, Riley
Nelle Florence Longenecker, . . . . .	Kansas City, Wyandotte
Grace Isabel Luthye, . . . . .	Topeka, Shawnee
Esther Grace Lyon, . . . . .	Manhattan, Riley
Grace Kerns McCoppin, . . . . .	Phillipsburg, Phillips
Pearle Irene McHenry, . . . . .	Paola, Miami
Mary Inez Mann, . . . . .	Wichita, Sedgwick
Sadie Mindie Marvin, . . . . .	Emporia, Lyon
Alice Montgomery, . . . . .	Wilsey, Morris
Corinne Myers, . . . . .	Marion, Ohio
Esther Serida Nelson, . . . . .	Manhattan, Riley
Ethel Elverna Newkirk, . . . . .	Geneseo, Rice
Ruth Sabina Nygren, . . . . .	Topeka, Shawnee
Gertrude Emeline Palmer, . . . . .	Hays, Ellis
Pauline Parkhurst, . . . . .	Kinsley, Edwards
(Mrs.) Eleanor Beverly Patrick, . . . . .	Manhattan, Riley
Mary Esther Peak, . . . . .	Pratt, Pratt
Eva May Pease, . . . . .	Manhattan, Riley
Ruby May Peck, . . . . .	Garnett, Anderson
Florence Nell Peppiatt, . . . . .	Ellsworth, Ellsworth
Grace Mav Pershing, . . . . .	Ogallah, Trego
Thurza Elizabeth Pitman, . . . . .	Manhattan, Riley
Evelyn Marie Potter, . . . . .	Barnes, Washington
Eula Bess Pyle, . . . . .	Lawrence, Douglas
Sara Bunitta Richardson, . . . . .	Kansas City, Wyandotte
Clara Louise Robbins, . . . . .	Colony, Anderson
Georgia Emma Roberts, . . . . .	Morrill, Brown
Helen Dena Robinson, . . . . .	Holton, Jackson
Madge Rowell, . . . . .	Strasburg, Missouri
Dorothy Schloh, . . . . .	Natoma, Osborne
Anna Winifred Searl, . . . . .	Morland, Graham
Meta Viola Sheaff, . . . . .	Kansas City, Wyandotte
Jennie Ellen Shoup, . . . . .	Udall, Cowley
Katharine O'Donnell Smith, . . . . .	Stockton, Rooks
Helen Mav Stewart, . . . . .	Spearville, Ford
Lois Katharine Stewart, . . . . .	Spearville, Ford
Edna Isabel St. John, . . . . .	Wamego, Pottawatomie
Marie Story, . . . . .	Manhattan, Riley
Helena Amelia Stromquist, . . . . .	Lindsborg, McPherson
Frieda Matilda Stuewe, . . . . .	Alma, Wabaunsee
Blanche Lovina Tanner, . . . . .	Manhattan, Riley
Anna Elizabeth Thomas, . . . . .	Kansas City, Missouri
Gertrude Tillotson, . . . . .	Manhattan, Riley
Mildred Tolles, . . . . .	Lawrence, Douglas
Alberlina Tulloss, . . . . .	Ottawa, Franklin
Aleatha Mae Tyner, . . . . .	Overbrook, Osage
Nellie Maude Vedder, . . . . .	Franklin, Nebraska
Louise Chester Walbridge, . . . . .	Russell, Russell
Clara Willis, . . . . .	Horton, Brown
Berenice Elena Wilson, . . . . .	Concordia, Cloud
Jessie Belle Woodworth, . . . . .	Tecumseh, Shawnee
Gertrude Wunder, . . . . .	Valley Falls, Jefferson
Esther Louise Zeininger, . . . . .	Wichita, Sedgwick

## JUNIORS—continued.

## GENERAL SCIENCE

<i>Names</i>	<i>Post office (county or state)</i>
Ernest Baird, . . . . .	Minneapolis, Ottawa
Frank Bergier, . . . . .	Glasco, Cloud
Verne Brothers, . . . . .	Agra, Phillips
Vernon Everett Bundy, . . . . .	Randolph, Riley
Herbert Spencer Coith, . . . . .	Manhattan, Riley
James Denison Colt, . . . . .	Manhattan, Riley
Granville Dorman, . . . . .	Paola, Miami
Edna Gulick, . . . . .	Winfield, Cowley
Robert John Hanna, . . . . .	Mankato, Jewell
Charles Axtell Hunter, . . . . .	Blue Rapids, Marshall
Mary Alberta Johnson, . . . . .	El Dorado, Butler
Eva Marguerite Kell, . . . . .	Manhattan, Riley
May Belle Landis, . . . . .	Kiowa, Barber
Phoebe Jane Lund, . . . . .	Manhattan, Riley
Harry Virgil Matthew, . . . . .	Manhattan, Riley
Belle Miller, . . . . .	Sabetha, Nemaha
Charlotte Morton, . . . . .	Ellsworth, Ellsworth
Edgar Leon Noel, . . . . .	Glasco, Cloud
Clara Anna Peairs, . . . . .	Topeka, Shawnee
Josephine Price Perrill, . . . . .	Manhattan, Riley
Lurd Astor Richards, . . . . .	Manhattan, Riley
Harold Edward Rose, . . . . .	Manhattan, Riley
Frank Sargent, . . . . .	Holton, Jackson
Hattie Christina Schaumburg, . . . . .	La Crosse, Rush
Erle Hazlett Smith, . . . . .	Kansas City, Wyandotte
Orliff Elmer Smith, . . . . .	Manhattan, Riley
Walter Francis Smith, . . . . .	Mankato, Jewell
Fred Stevenson, . . . . .	Salina, Saline
Viola Maude Sweet, . . . . .	Mankato, Jewell
Ina Belle Wilson, . . . . .	Wichita, Sedgwick
Kathryn Jane Wilson, . . . . .	Valley Falls, Jefferson
Hachiro Yuasa, . . . . .	Manhattan, Riley

## INDUSTRIAL JOURNALISM

Harry Coxe, . . . . .	Eskridge, Wabaunsee
John Randolph Hall, jr., . . . . .	Marshall, <i>Missouri</i>
Eva Hostetler, . . . . .	Manhattan, Riley
Dorian Paul Ricord, . . . . .	Esbon, Jewell

## SOPHOMORES

## AGRONOMY

Le Roy Alt, . . . . .	Norborne, <i>Missouri</i>
Alfred Carroll Aptiz, . . . . .	Manhattan, Riley
George Murray Arnold, . . . . .	Piedmont, Greenwood
William James Baker, . . . . .	Malta Bend, <i>Missouri</i>
Lester Ford Barnes, . . . . .	Fontana, Miami
Lester Jay Bell, . . . . .	Wellsville, Franklin
John Billings, . . . . .	Grantville, Jefferson
William Ray Bolen, . . . . .	Le Roy, Coffey
Daniel Madison Bursch, . . . . .	Buffalo, Wilson
George Rigg Campbell, . . . . .	Fulton, Bourbon
Ira Chapman, . . . . .	Manhattan, Riley
Kim Ak Ching, . . . . .	Honolulu, <i>Hawaii</i>
Anton Christian Christophersen, . . . . .	Garrison, Pottawatomie
James William Crumbaker, . . . . .	Onaga, Pottawatomie
William Deitz, . . . . .	Overland, Johnson
Robert Oren Deming, jr., . . . . .	Oswego, Labette
George Ernest Denman, . . . . .	Manhattan, Riley
Daniel Everett Donovan, . . . . .	Peru, <i>Nebraska</i>
George Engsbrand, . . . . .	Leonardville, Riley
Carl Eustace Fitzgerald, . . . . .	Dodge City, Ford
Irl Ferris Fleming, . . . . .	Manhattan, Riley
Claude Fletcher, . . . . .	Hiawatha, Brown
Lawrence Garlough, . . . . .	Cedarville, <i>Ohio</i>
Nathan Gish, . . . . .	Manhattan, Riley
Paul Bernard Gwin, . . . . .	Morrowville, Washington
Charles Franklin Holladay, . . . . .	Spearville, Ford
Walter Perry Hutchinson, . . . . .	Goddard, Sedgwick
Elmer Herman Jantz, . . . . .	Larned, Pawnee
Nicholas Tichon Jerebzooff, . . . . .	Manhattan, Riley
Donald Smith Jordan, . . . . .	Topeka, Shawnee
Charles Vincent Kershaw, . . . . .	Garrison, Pottawatomie
John Kiene, . . . . .	Valencia, Shawnee
Walter Scott Lay, . . . . .	Buffalo, Wilson

# *List of Students*

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## SOPHOMORES—*continued.*

<i>Names</i>	<i>Post office (county or state)</i>
Howard Allyn Lindsley, . . . . .	Manhattan, Riley
Reuben Edward Loänck, . . . . .	Manhattan, Riley
Claude Ewing Lovett, . . . . .	Eureka, Greenwood
Willard Earl Lyness, . . . . .	Walnut, Crawford
James Hendrix McAdams, . . . . .	Salina, Saline
Paul Campbell McGilliard, . . . . .	Manhattan, Riley
Albert John Mangelsdorf, . . . . .	Atchison, Atchison
Edwin Isaac Maris, . . . . .	Nortonville, Jefferson
James Robert Mason, . . . . .	Seneca, Nemaha
Thomas Edwin Moore, . . . . .	Manhattan, Riley
Ralph Vernon O'Neil, . . . . .	Wellsville, Franklin
John Thomas Pearson, . . . . .	Parsons, Labette
Joseph Vincent Quigley, . . . . .	Blaine, Pottawatomie
Earl Ramsey, . . . . .	Solomon, Dickinson
Archie Monroe Richards, . . . . .	Manhattan, Riley
Daniel Andrew Robbins, . . . . .	Colony, Anderson
Paul Robinson, . . . . .	Oswego, Labette
Rudolph George Rodewald, . . . . .	Yates Center, Woodson
James Walter Rolf, . . . . .	Pratt, Pratt
Glenn Charles Salisbury, . . . . .	Hays, Ellis
George McClellan Schick, jr., . . . . .	Plainview, <i>Texas</i>
Elmer Houser Schultz, . . . . .	Manhattan, Riley
Irwin Charles Scott, . . . . .	Agra, Phillips
Edward Loy You Shim, . . . . .	Kahului, <i>T. H.</i>
Guy Cephus Smith, . . . . .	Great Bend, Barton
Glenn Bryan Snapp, . . . . .	Belleville, Republic
Ralph Robinold St. John, . . . . .	Wamego, Pottawatomie
Harlan Randolph Sumner, . . . . .	Manhattan, Riley
Lewis Marten Umberger, . . . . .	Hymers, Chase
Archie Glenn Van Horn, . . . . .	Overbrook, Osage
Fred Wenn, . . . . .	Erie, Neosho
Price Harlan Wheeler, . . . . .	Garden City, Finney
Wilton Terry White, . . . . .	Jewell, Jewell
Raymond Hazzleton Whitenack, . . . . .	Manhattan, Riley
Martin William Wilson, . . . . .	Lincoln, Lincoln
Loftin Verdery Witcher, . . . . .	Fort Worth, <i>Texas</i>
Samuel Charles Yingling, . . . . .	El Dorado, Butler

## ANIMAL HUSBANDRY

Walter Brown Adair, . . . . .	Osawatomie, Miami
Raymond Voiles Adams, . . . . .	Eureka, Greenwood
Bernard Martin Anderson, . . . . .	Manhattan, Riley
Glen Harry Anderson, . . . . .	Lincoln, Lincoln
James Malcolm Aye, . . . . .	Manhattan, Riley
Hugh Edwin Baird, . . . . .	Formoso, Jewell
Henry Bengman Bayer, . . . . .	Toronto, Woodson
Orie Walter Beeler, . . . . .	Mankato, Jewell
Ary Clay Berry, . . . . .	Topeka, Shawnee
William Harrison Brookover, . . . . .	Eureka, Greenwood
Omar Olin Browning, . . . . .	Linwood, Leavenworth
Arthur Baptiste Bursh, . . . . .	Newton, Harvey
Orville Burtis, . . . . .	Fredonia, Wilson
William Ronald Cotton, . . . . .	Wamego, Pottawatomie
Lewie Elven Crandall, . . . . .	Le Roy, Coffey
Fred Cromer, . . . . .	Manhattan, Riley
Robert Elliott Curtis, . . . . .	Manhattan, Riley
Hugh Byron Dudley, . . . . .	Kansas City, Wyandotte
Frank Arthur Elliott, . . . . .	Yates Center, Woodson
Hilder Forsberg, . . . . .	Manhattan, Riley
Clarence Fickel, . . . . .	Manhattan, Riley
Herbert Horace Frizzell, . . . . .	Cherokee, <i>Oklahoma</i>
Shirley Richard Gardenhire, . . . . .	Alma, Wabaunsee
Charles Glenn Hale, jr., . . . . .	Kansas City, Wyandotte
Preston Hale, . . . . .	Manhattan, Riley
Harry Harlan, . . . . .	Smith Center, Smith
Frank Burton Hodgden, . . . . .	Manhattan, Riley
Louis Samuel Hodgson, . . . . .	Harveyville, Wabaunsee
John Herbert Howell, . . . . .	Waverly, Coffey
Frederick Anthony Kays, . . . . .	Eureka, Greenwood
Robert Ray Lancaster, . . . . .	Manhattan, Riley
Carl Richard Lawson, . . . . .	Mankato, Jewell
Thomas Robert Logan, . . . . .	Manhattan, Riley
Gerald Scott McNamara, . . . . .	Manhattan, Riley
Clair Foster Markley, . . . . .	Manhattan, Riley
Eugene Roy Martin, . . . . .	Eureka, Greenwood
Lewis Augustine Maury, . . . . .	San Antonio, <i>Texas</i>
John Arthur Meyer, . . . . .	Anthony, Harper
George Herbert Mulford, . . . . .	Topeka, Shawnee
Earl O'Connell, . . . . .	Kiowa, Barber

## SOPHOMORES—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Walter John Ott, . . . . .	Greenleaf, Washington
Ralph Paul Ramsey, . . . . .	Solomon, Dickinson
James Leroy Robinson, . . . . .	Nashville, Kingman
William Herbert Robinson, . . . . .	Holton, Jackson
Earl Franklin Shaw, . . . . .	Phillipsburg, Phillips
Emmett Warren Skinner, . . . . .	Manhattan, Riley
Charles Lorn Slentz, . . . . .	Great Bend, Barton
William Whitney Smith, . . . . .	Westphalia, Anderson
William Algeron Sutton, . . . . .	Carthage, <i>Missouri</i>
Roy Nelson Walker, . . . . .	Atchison, Atchison
Wayne Lycurgus Willhoite, . . . . .	Manhattan, Riley
Clarence Burton Williams, . . . . .	Bigelow, Marshall
Lewis Arthur Williams, . . . . .	Sylvan Grove, Lincoln

## DAIRY HUSBANDRY

Earl Edward Davis, . . . . .	Manhattan, Riley
Leon Aldrich Ek, . . . . .	McPherson, McPherson
Rudolph Emil Stuewe, . . . . .	Alma, Wabaunsee
Hubbard Oscar Stockwell, . . . . .	Larned, Pawnee

## HORTICULTURE

Morgan Thompson Binney, . . . . .	Kansas City, <i>Missouri</i>
William Cecil Calvert, . . . . .	Kansas City, Wyandotte
Edwin William Faulconer, . . . . .	Clay Center, Clay
Harry Alexander Gunning, . . . . .	Kansas City, Wyandotte
Robert Hezekiah Kidd, . . . . .	Dayton, <i>Ohio</i>
Everett Raymond McGalliard, . . . . .	Troy, Doniphan
Lowell Marston Mason, . . . . .	Belle Plaine, Sumner
Grosevenor Ward Putnam, . . . . .	Larned, Pawnee
Walter Roy Quinn, . . . . .	Bennington, Ottawa
James Curtis Riney, . . . . .	Pratt, Pratt
James Homer Sharpe, . . . . .	Council Grove, Morris
Elbert Lewis Smith, . . . . .	Soldier, Jackson
Frank Andrew Unruh, . . . . .	Haddam, Washington
Sidney Rendall Vandenberg, . . . . .	Kansas City, <i>Missouri</i>
Edmund Francis Wilson, . . . . .	Kansas City, <i>Missouri</i>

## VETERINARY MEDICINE

Richard Clay Chatman, . . . . .	Manhattan, Riley
John Bevenard Collister, . . . . .	Manhattan, Riley
Earl Morris Dobbs, . . . . .	Manhattan, Riley
Cecil Elder, . . . . .	Argonia, Sumner
Gerald Woodward Fitzgerald, . . . . .	Roswell, <i>New Mexico</i>
Asa Forest Flanagan, . . . . .	Chapman, Dickinson
Fred Hartwig, . . . . .	Goodland, Sherman
Eddell Charles Jones, . . . . .	Emporia, Lyon
Samuel Robert McArthur, . . . . .	Walton, Harvey
Curt Muller, . . . . .	Manhattan, Riley
Charles Ernest O'Neal, . . . . .	Wiggins, <i>Mississippi</i>
Eugene Frank Pile, . . . . .	Arkalon, Seward
George Thomas Reaugh, . . . . .	Burns, Marion
Glenn Armiel Riley, . . . . .	Manhattan, Riley

## ARCHITECTURE

William Herbert Broddle, . . . . .	Herington, Dickinson
Alvin Theodore Coith, . . . . .	Manhattan, Riley
Fred Evans, . . . . .	Wichita, Sedgwick
George Campbell Ferrier, . . . . .	Osborne, Osborne
Thomas Lewis Holley, jr., . . . . .	Manhattan, Riley
Henry Robert Horak, . . . . .	Munden, Republic
Charles Henry Kellogg, . . . . .	Manhattan, Riley
Fred Albert Korsmaier, . . . . .	Manhattan, Riley
Leo Leslie Smith, . . . . .	Hoisington, Barton

## CIVIL ENGINEERING

George Sheares Douglas, . . . . .	Beattie, Marshall
Andrew Earl Dyatt, . . . . .	Almena, Norton
Forrest Everette Gilmore, . . . . .	Manhattan, Riley
Edgar Goldsmith, . . . . .	Cheney, Sedgwick
Olley Harold Hamm, . . . . .	Arkansas City, Cowley
George Noel Herron, . . . . .	Kansas City, Wyandotte
Irwin Joseph Jacques, . . . . .	Manhattan, Riley
Elmer Johnson, . . . . .	Cheney, Sedgwick
Harry Ralph Johnston, . . . . .	Manhattan, Riley
Lawrence Antoine Leonard, . . . . .	Wamego, Pottawatomie
Merrifield Martling, . . . . .	Wichita, Sedgwick



## SOPHOMORES—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Leo Alexander Mingenback, . . . . .	McPherson, McPherson
Robert Francis Mirick, . . . . .	Otis, Rush
William Warren Rutter, . . . . .	Topeka, Shawnee
Paul Crowder Scheer, . . . . .	Topeka, Shawnee
Edward John Suydam, . . . . .	Leavenworth, Leavenworth
Loipaid Carl Teeter, . . . . .	Wamego, Pottawatomie
Ralph Pierce Van Zile, . . . . .	Manhattan, Riley
Ahoon Wong, . . . . .	Honolulu, T. H.

## ELECTRICAL ENGINEERING

Benjamin McKinley Andrews, . . . . .	Norcaton, Decatur
George Carrol Bailey, . . . . .	Bucklin, Ford
Elisha Boothe, . . . . .	Manhattan, Riley
Antis Monteville Butcher, . . . . .	Solomon, Dickinson
George Andrew Cunningham, . . . . .	Cheney, Sedgwick
Walter Emil Deal, . . . . .	Great Bend, Barton
Fabian Caleb Dickinson, . . . . .	Topeka, Shawnee
Robert Albert Graves, . . . . .	Abilene, Dickinson
James Sidney Hagan, . . . . .	Manhattan, Riley
Charlie Thomas Halbert, . . . . .	Agra Phillips
Paul Russell Helt, . . . . .	Winfield, Cowley
Andrew Herold, . . . . .	Seneca, Nemaha
William Kennedy Hervey, . . . . .	Centralia, Nemaha
Arthur Edward Hopkins, . . . . .	Tonganoxie, Leavenworth
Arlie Noel Johnson, . . . . .	Neosho Falls, Woodson
Talbot Roy Knowles, . . . . .	Manhattan, Riley
James Dallas Laughlin, . . . . .	Manhattan, Riley
Paul Revier Leamy, . . . . .	Ramona, Marion
Robert Bruce Leydig, . . . . .	El Dorado, Butler
Henry Dale Lincott, . . . . .	Milford, Geary
Arthur Wilford McCarter, . . . . .	Topeka, Shawnee
William Charles McGraw, . . . . .	Manhattan, Riley
Otto Irl Markham, . . . . .	Manhattan, Riley
Jay Meara, . . . . .	Axtell, Marshall
John William Musil, . . . . .	Blue Rapids, Marshall
Fred Hemmant Nash, . . . . .	Farmington, Arkansas
Robert Earl Nixon, . . . . .	Prairie View, Phillips
Earl Rathbun Phares, . . . . .	Parsons, Labette
Joseph Glenn Phinney, . . . . .	Manhattan, Riley
Earl Verne Plush, . . . . .	Penalosa, Kingman
John Prosser Rathbun, . . . . .	Downs, Osborne
Paul Charles Rawson, . . . . .	Wamego, Pottawatomie
Benjamin Burgess Richards, . . . . .	Delphos, Ottawa
John Paul Slade, . . . . .	Clay Center, Clay
Alta Roy Tanner, . . . . .	Iola, Allen
Dodderidge Calvin Tate, . . . . .	Manhattan, Riley
Wood Tebbe, . . . . .	Great Bend, Barton
Harry Tyrell, . . . . .	Topeka, Shawnee
George Lin Usselman, . . . . .	Coldwater, Comanche
Thomas Kenneth Vincent, . . . . .	Kansas City, Missouri
Horace Alfred Williams, . . . . .	Sylvan Grove, Lincoln

## MECHANICAL ENGINEERING

Joseph Jesse Abernethy, . . . . .	Gonzales, Texas
Albert Cecil Arnold, . . . . .	Manhattan, Riley
Samuel Edwin Barnes, . . . . .	Blue Mound, Linn
Fenton France Borst, . . . . .	Windom, Minnesota
Lawrence Irwin Champe, . . . . .	Greeley, Anderson
Charles Elbert Curtis, . . . . .	Manhattan, Riley
Walter Freeburg, . . . . .	Lindsborg, McPherson
Homer Arthur Herrick, . . . . .	Manhattan, Riley
Ralph Holland, . . . . .	Pleasanton, Linn
Horace Everett Pateman, . . . . .	Leavenworth, Leavenworth
Frank Richard Rawson, . . . . .	Wamego, Pottawatomie
Lyman Jay Rees, . . . . .	Talmage, Dickinson
Charles Sappin, . . . . .	Manhattan, Riley
George William Schneider, . . . . .	Logan, Phillips
Foster Leonard Shelley, . . . . .	Elmdale, Chase
Walter Alvin Simpson, . . . . .	Manhattan, Riley
Diamond Richard Smith, . . . . .	Lawrence, Douglas
Roscoe Noyes St. John, . . . . .	Wamego, Pottawatomie
Vester Wells, . . . . .	Anthony, Harper
Leslie Adam Wilsey, . . . . .	Chapman, Dickinson
Charles Herman Zimmerman, . . . . .	Stillwell, Johnson

## SOPHOMORES—continued.

## HOME ECONOMICS

<i>Names</i>	<i>Post office (county or state)</i>
Ruth Adams, . . . . .	Manhattan, Riley
Helen Josephine Allis, . . . . .	Manhattan, Riley
Mamie Arnold, . . . . .	Cottonwood Falls, Chase
Leah Catharine Bailey, . . . . .	Topeka, Shawnee
Orlena Marguerite Baker, . . . . .	Manhattan, Riley
Anne Estella Barnum, . . . . .	Simpson, Mitchell
Marcia Beamson, . . . . .	Macksville, Stafford
(Mrs.) Anna Gish Bellomy, . . . . .	Manhattan, Riley
Ada Grace Billings, . . . . .	Vermillion, Marshall
Faye Maurine Boswell, . . . . .	Manhattan, Riley
Helen Elizabeth Bower, . . . . .	Lincoln, Lincoln
Edith Alice Boyle, . . . . .	Spivey, Kingman
Anna Brandner, . . . . .	Florence, Marion
Mildred Branson, . . . . .	Cambridge, Cowley
Amy May Briggs, . . . . .	Sedgwick, Harvey
Fannie Ernestine Brooks, . . . . .	Tescott, Ottawa
Margaret Isla Bruce, . . . . .	Marquette, McPherson
Wilma Burtis, . . . . .	Fredonia, Wilson
Hannah Margaret Campbell, . . . . .	Attica, Harper
Florence Caton, . . . . .	Foxboro, Massachusetts
Clara May Christensen, . . . . .	Argentine, Wyandotte
Mae Coleman, . . . . .	Little Rock, Arkansas
Martha Christabel Conrad, . . . . .	Manhattan, Riley
Kathleen Lenore Conroy, . . . . .	Manhattan, Riley
Grace Nancy Cool, . . . . .	Glasco, Cloud
Grace Lydia Currie, . . . . .	Manhattan, Riley
Mary Augusta Davies, . . . . .	Green, Clay
Wilma Louise Davis, . . . . .	Manhattan, Riley
Florence Edith Dodd, . . . . .	Langdon, Reno
Mae Doonan, . . . . .	Kansas City, Wyandotte
Faith Elizabeth Earnest, . . . . .	Washington, Washington
Frances Floretta Ewalt, . . . . .	Manhattan, Riley
Martha Fern Faubion, . . . . .	Manhattan, Riley
Ruth Marie Ferguson, . . . . .	Manhattan, Riley
Nelle Flinn, . . . . .	Admire, Lyon
Anna Grace Fox, . . . . .	Larned, Pawnee
Ruth Esther Frush, . . . . .	Kansas City, Wyandotte
Margaret Elizabeth Fuller, . . . . .	Topeka, Shawnee
Grace Gardner, . . . . .	Hartford, Lyon
Dorothea Pearl Gish, . . . . .	Manhattan, Riley
Elizabeth Emma Gish, . . . . .	Manhattan, Riley
Mary Alice Gish, . . . . .	Sterling, Rice
Gladys Gist, . . . . .	Manhattan, Riley
Marie Antoinette Goodman, . . . . .	Dwight, Morris
Mamie Blanche Gorrell, . . . . .	Wa Keeney, Trego
Leona Sanders Graves, . . . . .	Inman, McPherson
Mary Greensawalt, . . . . .	Princeton, Franklin
Roma Lillian Greene, . . . . .	Newton, Harvey
Josie Griffith, . . . . .	Manhattan, Riley
Leota Lee Gromer, . . . . .	Manhattan, Riley
Esther Gygas, . . . . .	Osborne, Osborne
Blanche Mary Haggman, . . . . .	Kackley, Republic
Hildegard Elulia Harlan, . . . . .	Manhattan, Riley
Verda Harris, . . . . .	Manhattan, Riley
Mabel Joy Harrison, . . . . .	Manhattan, Riley
Elsie Elnora Hart, . . . . .	Edgar, Nebraska
Edna Avis Hawkins, . . . . .	Lincoln, Lincoln
Helene Held, . . . . .	Clay Center, Clay
Nettie Hendrickson, . . . . .	Manhattan, Riley
Alta Sarah Hepler, . . . . .	Manhattan, Riley
Bessie May Hildreth, . . . . .	Altamont, Labette
Ruth Brandt Hoffman, . . . . .	Newton, Harvey
Lydia Helena Hokanson, . . . . .	Marquette, McPherson
Bertha Belle Hole, . . . . .	Manhattan, Riley
Esther Grace Hole, . . . . .	Manhattan, Riley
Esther Lydia Hostetler, . . . . .	Manhattan, Riley
Mabel Marguerite Hunter, . . . . .	Manhattan, Riley
Ruth Amelia Hutchings, . . . . .	Manhattan, Riley
Katherine Ruth Hutto, . . . . .	Manhattan, Riley
Agnes McCord Irwin, . . . . .	Manhattan, Riley
Pearl LaClair Jacques, . . . . .	Manhattan, Riley
Mary Florence Jones, . . . . .	Salina, Saline
Florence Justin, . . . . .	Manhattan, Riley
Wilma Anna Kammeyer, . . . . .	Manhattan, Riley
Vera Elma King, . . . . .	Milo, Lincoln
Bertha Blanche Langer, . . . . .	Manhattan, Riley
Eva Myrtle Lawson, . . . . .	McPherson, McPherson
Anna Virginia Layton, . . . . .	Blue Rapids, Marshall

# List of Students

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## SOPHOMORES—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Mabel Lorraine Leuszler, . . . . .	Linn, Washington
Anna May Lorimer, . . . . .	Willis, Brown
Vera Anna McCoy, . . . . .	Imperial, Nebraska
Irene Margaret McElroy, . . . . .	Manhattan, Riley
Bessie McGraw, . . . . .	Manhattan, Riley
Mary Elizabeth McKinlay, . . . . .	Udall, Cowley
Ora Mae McMillen, . . . . .	Topeka, Shawnee
Elizabeth Abbie March, . . . . .	Topeka, Shawnee
Elsie Beth Marshall, . . . . .	Clifton, Washington
Sarah Janet Marty, . . . . .	Manhattan, Riley
Lucile Maughlin, . . . . .	Sterling, Rice
Elizabeth Mills, . . . . .	Topeka, Shawnee
Ella Mae Miltner, . . . . .	Wichita, Sedgwick
Helen Joyce Moore, . . . . .	Manhattan, Riley
Marie Moses, . . . . .	Manhattan, Riley
Mary Rose Moss, . . . . .	Eureka, Greenwood
Helen Munger, . . . . .	Carbondale, Osage
Vivian Neiswender, . . . . .	North Topeka, Shawnee
Edna May Oetinger, . . . . .	Alma, Wabaunsee
Olela May Pace, . . . . .	Osawatomie, Miami
Susan Rufina Paddock, . . . . .	Blue Mound, Linn
Ruth Louise Pattin, . . . . .	Topeka, Shawnee
Sara Jane Patton, . . . . .	Hiaawatha, Brown
Hazel Berdella Peck, . . . . .	Manhattan, Riley
Ella Dunlap Phenicie, . . . . .	Tonganoxie, Leavenworth
Gladys Marie Phillips, . . . . .	Manhattan, Riley
Edna Pickrell, . . . . .	Manhattan, Riley
Marie Pickrell, . . . . .	Manhattan, Riley
Helen Mitchell Pitcairn, . . . . .	Concordia, Cloud
Cora Alberta Pitman, . . . . .	Manhattan, Riley
Mary Elizabeth Polson, . . . . .	Fredonia, Wilson
Nellie Pope, . . . . .	Hoxie, Sheridan
Iva Holt Porter, . . . . .	Glen Elder, Mitchell
Mary Louise Price, . . . . .	Winfield, Iowa
Gourney Augusta Prier, . . . . .	Marion, Marion
Hermina Mealina Quantic, . . . . .	Riley, Riley
Golda Lucile Rader, . . . . .	Manhattan, Riley
Cassie Katherine Richards, . . . . .	Manhattan, Riley
Nannie Clytice Ross, . . . . .	Burrton, Harvey
Grace Ethelynn Rudy, . . . . .	Manhattan, Riley
Mabel Gertrude Ruggels, . . . . .	Beverly, Lincoln
Margaret Ursula Schneider, . . . . .	Logan, Phillips
Pearl Eunice Schowalter, . . . . .	Halstead, Harvey
Evelyn Schriver, . . . . .	Halstead, Harvey
Laura Lee Setliff, . . . . .	Kansas City, Wyandotte
Gladys Shinn, . . . . .	Manhattan, Riley
Florence Hazel Smith, . . . . .	Manhattan, Riley
Esther Emily St. John, . . . . .	Manhattan, Riley
Hazel Belle St. John, . . . . .	Manhattan, Riley
Kate Summers, . . . . .	Riley, Riley
Pearl Ellice Tackett, . . . . .	Yates Center, Woodson
Emma Elizabeth Taylor, . . . . .	Wichita, Sedgwick
Ethel Tharp, . . . . .	Hutchinson, Reno
Irene Venita Thompson, . . . . .	Topeka, Shawnee
Eva Esther Townsend, . . . . .	Nickerson, Reno
Verna Treadway, . . . . .	Newton, Harvey
Mary Tunstall, . . . . .	Manhattan, Riley
Mary Edith Updegraff, . . . . .	Topeka, Shawnee
Wilma Van Horn, . . . . .	Overbrook, Osage
Avis Louise Voak, . . . . .	Worthington, Minnesota
Irene Eleanor Walker, . . . . .	Manhattan, Riley
Edith Mary Walsh, . . . . .	Manhattan, Riley
Mamie Wartenbee, . . . . .	Liberal, Seward
Lois Wemmer, . . . . .	Princeton, Franklin
Laura Augusta Westphal, . . . . .	Manhattan, Riley
Grace Willits, . . . . .	Topeka, Shawnee
Emily Thomas Wilson, . . . . .	Manhattan, Riley
Ida May Wilson, . . . . .	Manhattan, Riley
Winnie Fay Wilson, . . . . .	Formoso, Jewell
Eleanor Witham, . . . . .	
Lois Witham, . . . . .	Manhattan, Riley
Elizabeth Pearl Woods, . . . . .	Wichita, Sedgwick

## GENERAL SCIENCE

Francis Waite Albro, . . . . .	Manhattan, Riley
Edith Louise Alsop, . . . . .	Wakefield, Clay
Edith Emma Arnold, . . . . .	Manhattan, Riley
Wellington Tufts Brink, . . . . .	Manhattan, Riley
Mortimer Lester Durbon, . . . . .	Junction City, Geary

## SOPHOMORES—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Samuel Ray Gardner, . . . . .	Hartford, Lyon
Earl Raymond Harrouff, . . . . .	Inman, McPherson
Charles Hopper, . . . . .	Manhattan, Riley
Ralph Parkinson Howell, . . . . .	Morganville, Clay
Garnet Hutto, . . . . .	Manhattan, Riley
Myrtel Johnson, . . . . .	Manhattan, Riley
Ward Loddell, . . . . .	Great Bend, Barton
Albert Bruce Lovett, . . . . .	Larned, Pawnee
Robert Urey McClanahan, . . . . .	Manhattan, Riley
David Earl Moore, . . . . .	Idana, Clay
Raymond Reed Neiswender, . . . . .	Topeka, Shawnee
Guy Clifton Omer, . . . . .	Mankato, Jewell
Edward John Otto, . . . . .	Riley, Riley
Earlwin Arthur Pearce, . . . . .	Edgerton, Johnson
Rayburn Potter, . . . . .	Clifton, Washington
Merle Elliott Ranney, . . . . .	Clyde, Cloud
Emmett Warren Skinner, . . . . .	Manhattan, Riley
Mary Louetta Taylor, . . . . .	Manhattan, Riley
Harry Fred Vaupel, . . . . .	New Cambria, Saline
Howard Oscar Wagner, . . . . .	Manhattan, Riley
Arthur Walker, . . . . .	Manhattan, Riley
Lyndell Whitehead, . . . . .	Walnut, Crawford
Vera Isabel Whitmore, . . . . .	Manhattan, Riley
Fred Woodward, . . . . .	El Dorado, Butler

## INDUSTRIAL JOURNALISM

Albert Ellis Hylton, . . . . .	Manhattan, Riley
John McClenahan, . . . . .	Kansas City, Wyandotte
Owen Floyd McKittrick, . . . . .	McCracken, Rush
George Siefkin, . . . . .	Newton, Harvey
(Mrs.) Margaret James Schattenburg, . . . . .	Manhattan, Riley

## FRESHMEN

## AGRICULTURE

Henry Joseph Adams, . . . . .	Topeka, Shawnee
Russell Orville Andruss, . . . . .	Elsmore, Allen
Walter Hubert Artman, . . . . .	Denison, Jackson
John Burton Barnes, . . . . .	Bellaire, Smith
Phillip Asa Barnes, . . . . .	Blue Mound, Linn
Frederick Harold Bayer, . . . . .	Yates Center, Woodson
Dee Daniel Bird, . . . . .	Great Bend, Barton
Carlos Tomas Bischoff, . . . . .	Manhattan, Riley
Edward James Bogh, . . . . .	Lincoln, Lincoln
George Adam Bolz, . . . . .	Topeka, Shawnee
Charles Russel Brackney, . . . . .	Burlingame, Osage
George Harold Brett, jr., . . . . .	Fonca City, Oklahoma
Curtis Angle Brewer, . . . . .	Abilene, Dickinson
Earl Briney, . . . . .	Abilene, Dickinson
Luster Roy Brooks, . . . . .	Winfield, Cowley
Wesley Gordon Bruce, . . . . .	New York, New York
Ralph Dilly Buell, . . . . .	Winfield, Cowley
Floyd Hine Buvinger, . . . . .	Chetopa, Labette
James Carle, . . . . .	Gretna, Phillips
Wellman Dean Chaffin, . . . . .	Raymore, Missouri
Clarence Chapman, . . . . .	Manhattan, Riley
Stewart Clarke, . . . . .	Marysville, Marshall
Robert Earl Cleland, . . . . .	Manhattan, Riley
Carl Carey Cope, . . . . .	Holton, Jackson
Clyde Cordts, . . . . .	Overbrook, Osage
Harold Robert Cozine, . . . . .	Linn, Washington
Harold Brink Cravens, . . . . .	Parsons, Labette
Blaine Crow, . . . . .	Manhattan, Riley
Jay Howenstine Cushman, . . . . .	Emporia, Lyon
Neil Edwin Dale, . . . . .	Kansas City, Wyandotte
Paul Oscar Dannevik, . . . . .	Troy, Doniphan
Frank Alfred Detweiler, . . . . .	Summerfield, Marshall
Glen Ewing Devier, . . . . .	Fall River, Greenwood
Alexey Evguenievich Dobrohotov, . . . . .	Viazniki Vladim, Russia
George Emery Dodson, . . . . .	Caney, Montgomery
Frank Elsworth Dowling, . . . . .	Chicago, Illinois
Roy Kiefner Durham, . . . . .	Anthony, Harper
Howard Conwell Edwards, . . . . .	Jewell, Jewell
Wilbur Gordon Elliott, . . . . .	Sterling, Rice
Paul John Englund, . . . . .	Falun, Saline
William Raymond Essick, . . . . .	Eureka, Greenwood
Myron Lee Eubank, . . . . .	Emporia, Lyon

# List of Students

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## FRESHMEN—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Morris Evans, . . . . .	Topeka, Shawnee
William Lynde Farnsworth, . . . . .	Portis, Osborne
Warren Fehlman, . . . . .	Manhattan, Riley
Robert James Fisher, . . . . .	Liberal, Seward
Edward Raymond Frank, . . . . .	Manhattan, Riley
Ira Gordon Freeman, . . . . .	Ellsworth, Ellsworth
Vernon Frank Fritz, . . . . .	Valencia, Shawnee
Lynn Harold Fuller, . . . . .	Horton, Brown
John Thomas Furneaux, . . . . .	Moran, Allen
Cassius Gillespie, . . . . .	Chetopa, Labette
Otis Benton Glover, . . . . .	Circleville, Jackson
Wilbur Ross Gore, . . . . .	Manhattan, Riley
Clarence Owen Grandfield, . . . . .	Maize, Sedgwick
Robert Marion Greer, . . . . .	Bonner Springs, Wyandotte
William Herbert Green, . . . . .	Olathe, Johnson
Edward Gregory, . . . . .	Manhattan, Riley
Albert William Griffith, . . . . .	Barnard, Lincoln
Ray Harter, . . . . .	St. John, Stafford
Ernest Clarence Harvey, . . . . .	South Omaha, Nebraska,
Burtis Emerson Heacock, . . . . .	Attica, Harper
Carl Lawrence Hedstrom, . . . . .	Dinas, Wallace
Leslie Henderson, . . . . .	Seneca, Nemaha
Waldo Frederick Heppe, . . . . .	Wichita, Sedgwick
Ivan Walter Herriott, . . . . .	Garden City, Finney
Lee Raeburn Hettick, . . . . .	Williamsburg, Franklin
Lyman Ray Hiatt, . . . . .	Esbon, Sherman
Douglas Abijah Hine, . . . . .	Manhattan, Riley
Harold Irving Hollister, . . . . .	Quincy, Greenwood
Madison Lewelen Holroyd, . . . . .	Cedar Vale, Chautauqua
William Lowell Hook, . . . . .	Rossville, Shawnee
Jeffrey Horney, . . . . .	Neodesha, Wilson
Louis Edward Howard, . . . . .	Manhattan, Riley
Clarence Blythe Howe, . . . . .	Garrison, Pottawatomie
Carl Fountain Huffman, . . . . .	Tonganoxie, Leavenworth
Dwight Hull, . . . . .	Abilene, Dickinson
Gustave Arthur Heinig, . . . . .	Wichita, Sedgwick
John Ralph Hudelson, . . . . .	Pomona, Franklin
Gilford John Ikenberry, . . . . .	Quinter, Gove
Glenn William Keith, . . . . .	Belleville, Republic
Floyd Brode Kelly, . . . . .	Kansas City, Wyandotte
Ross Bartley Keys, . . . . .	Winchester, Jefferson
Arthur Hamilton Knight, . . . . .	Chapman, Dickinson
Howard Morrison Knox, . . . . .	Garden City, Finney
Theodore Charles Krigbaum, . . . . .	Bisbee, Arizona
John Lawrence Lantow, . . . . .	Lyons, Rice
Lawrence Lykins Lauver, . . . . .	Paola, Miami
John Linn, . . . . .	Manhattan, Riley
Harold William Luhnnow, . . . . .	Oak Park, Illinois
Charles Louis Lytle, . . . . .	Wellsville, Franklin
Ray McClaran, . . . . .	Humboldt, Allen
Cecil Lyman McFadden, . . . . .	Stafford, Stafford
Roscoe Irwin MacMillan, . . . . .	Kansas City, Wyandotte
Daniel Claire Marshall, . . . . .	Belle Plaine, Sumner
William Martin, . . . . .	Wathena, Doniphan
Carl Ivor Mattson, . . . . .	Manhattan, Riley
Charles Miles, . . . . .	Garden City, Finney
Edgar Cruger Miller, . . . . .	Anthony, Harper
Herbert Proudft Miller, . . . . .	Kansas City, Wyandotte
Ben Moore, . . . . .	Manhattan, Riley
Russell Morrison, . . . . .	Sterling, Rice
Ralph Landis Mosier, . . . . .	Muskogee, Oklahoma
Harry Allison Murphy, . . . . .	Sterling, Rice
Kenneth Moody Murphy, . . . . .	Pontiac, Illinois
Richard Baldwin Myers, . . . . .	Jeffersonville, Indiana
Peter Netterville, . . . . .	Manhattan, Riley
Arthur Reid Newkirk, . . . . .	Geneseo, Rice
Dean Orr, . . . . .	Kanona, Decatur
Robert Osborn, jr., . . . . .	Wichita, Sedgwick
Ross Palenske, . . . . .	Alma, Wabaunsee
Earle Peck, . . . . .	Berryton, Shawnee
Thomas Edwin Pexton, . . . . .	Carr, Colorado
Telford Ruddell Pharr, . . . . .	Manhattan, Riley
Howard Waitman Phillips, . . . . .	Hutchinson, Reno
William Francis Pickett, . . . . .	Manhattan, Riley
Floyd Pickrell, . . . . .	Manhattan, Riley
Chester Lee Reeve, . . . . .	Garden City, Finney
Robert Hall Rexroad, . . . . .	Darlow, Reno
Frank Irving Reynolds, . . . . .	Mulvane, Sumner
George Wilson Rhine, . . . . .	Manhattan, Riley

## FRESHMEN—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Lyle Verne Rhine, . . . . .	Manhattan, Riley
Clarence Edwin Roach, . . . . .	Manhattan, Riley
Francisco Rodriguez, . . . . .	OeeNez, P. I.
Harold Adelbert Rohrer, . . . . .	Junction City, Geary
Charles Lucien Russel, . . . . .	McPherson, McPherson
Harry Schafer, . . . . .	Mulvane, Sumner
Carl Schulthess, . . . . .	Horton, Brown
Gilbert Alexander Searight, . . . . .	Austin, Texas
Frank Clarence Seeber, . . . . .	Great Bend, Barton
John Sellon, . . . . .	Kansas City, Missouri
Sam Sherwood, . . . . .	Excelsior Springs, Missouri
Simon Peter Shields, . . . . .	Lost Springs, Marion
Piatt Noah Slough, . . . . .	Quincy, Greenwood
Harold Wyllis Snell, . . . . .	Douglass, Butler
Fayette Foster Spencer, . . . . .	Circleville, Jackson
Emmet Hibler Stambaugh, . . . . .	Maplehill, Wabunsee
Herman Joseph Steinbuchel, . . . . .	Wichita, Sedgwick
John Robert Stratford, . . . . .	El Dorado, Butler
Joseph Burton Sweet, . . . . .	Manhattan, Riley
Clifford Swenson, . . . . .	Lindsborg, McPherson
Sherman Alton Swift, . . . . .	Beloit, Mitchell
Glen Teeple, . . . . .	Mankato, Jewell
Charles David Thomas, . . . . .	Baxter Springs, Cherokee
Harold Elliot Thomas, . . . . .	Pratt, Pratt
Lee Thomas, . . . . .	Baxter Springs, Cherokee
Frank Sumner Turner, . . . . .	Tonganoxie, Leavenworth
Halley Clyde Walker, . . . . .	Green, Clay
Owen Walters, . . . . .	Roswell, New Mexico
Ed Mitchell Watkins, . . . . .	Garden City, Finney
Reed Weimer, . . . . .	Chapman, Dickinson
Carl Ellsworth White, . . . . .	Clements, Chase
Joe Marshall White, . . . . .	Topeka, Shawnee
Joseph Newton Wilmers, . . . . .	Bayfield, Colorado
Harold Spencer Winn, . . . . .	Wathena, Doniphan
Adrian Lee Wolfert, . . . . .	Kansas City, Missouri
Jay Roy Wood, . . . . .	Reading, Lyon
Lawrence Alden Woodworth, . . . . .	Tecumseh, Shawnee
Wilbur William Wright, . . . . .	Newton, Harvey
Wilhelm Wunsch, . . . . .	Argonia, Sumner
James Carl Yost, . . . . .	Vassar, Osage
Herman Henry Zimmerman, . . . . .	Belle Plaine, Sumner
Louis Albert Zimmerman, . . . . .	Belle Plaine, Sumner

## VETERINARY MEDICINE

Aaron Arthur Brecheisen, . . . . .	Edgerton, Johnson
Ray Nelson Brown, . . . . .	Belleville, Republic
Robert Brown Craig, . . . . .	Manhattan, Riley
Ernest Eddy, . . . . .	Havensville, Pottawatomie
John Fitzgerald, . . . . .	Gypsum City, Saline
Harve Frank, . . . . .	Jewell, Jewell
John Edward Franz, . . . . .	Rozel, Pawnee
John Fredenburg, . . . . .	Council Grove, Morris
David Maxon Green, . . . . .	Manhattan, Riley
Henry Arthur Hoffman, . . . . .	Princeton, Franklin
William Albert Houk, . . . . .	Americus, Lyon
Edmund Hubert Hovey, . . . . .	Cambridge, Cowley
Dan Jackson, . . . . .	Mayo, Comanche
Charles Earl Long, . . . . .	Blue Mound, Linn
Clarence Hugh Rawlings, . . . . .	Havensville, Pottawatomie
Karl Richardson, . . . . .	Circleville, Jackson
Harry Van Tuyl, . . . . .	Basehor, Leavenworth
Lloyd Leroy Whitney, . . . . .	Lyndon, Osage
Josiah Wistar Worthington, . . . . .	Richfield, Morton

## ARCHITECTURE

Oliver Frederick Barnhart, . . . . .	Kansas City, Wyandotte
William Richard Cristler, . . . . .	Edgerton, Johnson
Earl Kesinger, . . . . .	Greensburg, Kiowa
Theodore Legrand Shuart, . . . . .	Hutchinson, Reno

## CIVIL ENGINEERING

Lawrence Claud Bernard, . . . . .	Sharon Springs, Wallace
David Winfred Burch, . . . . .	Salina, Saline
Albert Clarence Bux, . . . . .	Meriden, Jefferson
Bung Chew Choy, . . . . .	Honolulu, Hawaii
William Hoy Chun, . . . . .	Honolulu, Hawaii
Henry Cornell, . . . . .	Wakefield, Clay
Simon Edward Croyle, . . . . .	New Cambria, Saline

# List of Students

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## FRESHMEN—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Amon Carl Davis, . . . . .	Harper, Harper
Roscoe Vanda Elliott, . . . . .	Medicine Lodge, Barber
Don Groth, . . . . .	Bushton, Rice
Jesse Alonzo Hendrickson, . . . . .	St. John, Stafford
Robert Kerr, jr., . . . . .	Wakefield, Clay
Addison Kendall McKinnell, . . . . .	Maize, Sedgwick

## ELECTRICAL ENGINEERING

Thomas Alleman, . . . . .	Kansas City, Wyandotte
William Harold Balderston, . . . . .	Dodge City, Ford
James Glenn Bell, . . . . .	Altoona, Wilson
Paul Adelbert Carnahan, . . . . .	Manhattan, Riley
Albert Ross Challans, . . . . .	Newton, Harvey
Ralph Edwin Collins, . . . . .	Wellsville, Franklin
William O'Neil Collins, . . . . .	Wellsville, Franklin
John Edward Conner, . . . . .	Circleville, Jackson
Francis Dunlap, . . . . .	Keats, Riley
William Christoph Ernsting, . . . . .	Ellinwood, Barton
Jefferson Harold Flora, . . . . .	Manhattan, Riley
Kenneth Francis, . . . . .	Neosho Falls, Woodson
Ernest Franklin Golding, . . . . .	Newton, Harvey
Clarence Hildebrand, . . . . .	Manhattan, Riley
Olin Arthur Hindman, . . . . .	Rush Center, Rush
William Eugene Houser, . . . . .	Topeka, Shawnee
James Allison Hull, . . . . .	Stafford, Stafford
Carl David Hultgren, . . . . .	Topeka, Shawnee
Wallace Darwin Hutchinson, . . . . .	Wichita, Sedgwick
William Chester Humphrey, . . . . .	Hoxie, Sheridan
Thomas Hardman Jester, . . . . .	Oxford, Sumner
Vernon Marion Johnson, . . . . .	Kinsley, Edwards
Herbert Bernard King, . . . . .	Arkansas City, Cowley
Rufus Stephen Kirk, . . . . .	Manhattan, Riley
William Klooz, . . . . .	Manhattan, Riley
Charles Edward Lavender, . . . . .	Alton, Osborne
John Benton Mason, . . . . .	Stockdale, Riley
George Harold Morehouse, . . . . .	Little River, Rice
Ivan Harry Nash, . . . . .	Waterville, Marshall
Clair Newton, . . . . .	Bronson, Bourbon
Russell Harry Oliver, . . . . .	Oxford Sumner
Augustus Stanley Parr, . . . . .	Rossville, Shawnee
John Patton, . . . . .	Chase, Rice
Perie Richmond Pitts, . . . . .	Manhattan, Riley
Leslie Lee Purdy, . . . . .	Fairview, Brown
Oliver Keith Rumbel, . . . . .	Moran, Allen
Lloyd Lester Sissell, . . . . .	Cuba, Republic
William Arthur Smith, . . . . .	Pittsburg, Crawford
Wade McKinley Snider, . . . . .	Ablene, Dickinson
Sidney Robbins Swaller, . . . . .	Clay Center, Clay
Jesse Harold Talmage, . . . . .	Wa Keeney, Trego
Newton Ebenezer Terrill, . . . . .	Tisdale, Cowley
Lester Tubbs, . . . . .	Manhattan, Riley
Olin Walker, . . . . .	Beloit, Mitchell
Carl Adolph Wallerstedt, . . . . .	Lindsborg, McPherson
Carey Ray Witham, . . . . .	Manhattan, Riley
Frank Earl Whipple, . . . . .	Manhattan, Riley
Ezra Taggart Whitcomb, . . . . .	Cedar Point, Chase

## MECHANICAL ENGINEERING

William Frederick Asendorf, . . . . .	Garden Plain, Sedgwick
Charles Cotting Brown, . . . . .	Ellsworth, Ellsworth
William Newton Caton, . . . . .	Winfield, Cowley
Charles Kenneth Champlin, . . . . .	Canton, McPherson
Robert Travis Corbin, . . . . .	Manhattan, Riley
George Stephen Dennett, . . . . .	Harper, Harper
Lester Henry Drayer, . . . . .	Manhattan, Riley
George Livingston Fickel, . . . . .	Manhattan, Riley
William Walter Frizell, . . . . .	Larned, Pawnee
Leon Bernard Garvin, . . . . .	Erie, Neosho
Lawton Morrison Hanna, . . . . .	Clay Center, Clay
Keith Egleston Kinyon, . . . . .	Vernon, Woodson
Loren Little Lupfer, . . . . .	Larned, Pawnee
Edwin Francis Meara, . . . . .	Axtell, Marshall
Edgar Andrew Moffat, . . . . .	Great Bend, Barton
Joe Anthony Novak, . . . . .	Ellsworth, Ellsworth
Url Nudson, . . . . .	Garrison, Pottawatomie
Howard Walter Orr, . . . . .	Topeka, Shawnee
William Ewing Paterson, . . . . .	Yates Center, Woodson

## FRESHMEN—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Christian Pfaff, . . . . .	Hazelton, Barber
Carew Henry Sanders, . . . . .	Manhattan, Riley
Arthur Lorenzo Seeber, . . . . .	Great Bend, Barton
Gabe Alfred Sellers, . . . . .	Great Bend, Barton
Russel Robert Smith, . . . . .	Stockton, Rooks
Earl Ebenezer Swenson, . . . . .	Lindsborg, McPherson
Lawrence Arthur Tilton, . . . . .	Garrison, Pottawatomie
Gustav Peter Toews, . . . . .	Newton, Harvey
Rees Conway Warren, . . . . .	Manhattan, Riley

## HOME ECONOMICS

Essie Jane Anderson, . . . . .	Lawrence, Douglas
Edith Irene Andrew, . . . . .	Madison, Greenwood
Madge Gladys Austin, . . . . .	Manhattan, Riley
Blanche Baird, . . . . .	Manhattan, Riley
Eunice Ann Baird, . . . . .	Cherryvale, Montgomery
Rose Theodora Baker, . . . . .	Topeka, Shawnee
Mildred Gertrude Barnes, . . . . .	Rock Creek, Jefferson
Ruth Sarah Barnes, . . . . .	Rock Creek, Jefferson
Mildred Edith Batchelor, . . . . .	Manhattan, Riley
Anna Pearl Bates, . . . . .	Dighton, Lane
Myrtle Ethel Bauerfind, . . . . .	Minneapolis, Ottawa
Dora Wilhelmina Bayer, . . . . .	Toronto, Woodson
Mildred Lucille Beane, . . . . .	Chillicothe, Missouri
Beryl Beaty, . . . . .	Linn, Washington
Laura Elizabeth Becker, . . . . .	Logan, Phillips
Clara Merle Beeman, . . . . .	Topeka, Shawnee
Lois Viola Bellomy, . . . . .	Manhattan, Riley
Ada Berger, . . . . .	Lawrence, Douglas
Neva Betz, . . . . .	Asherville, Mitchell
Martha Estella Blain, . . . . .	Manhattan, Riley
Charlotte Bolen, . . . . .	Le Roy, Coffey
Nelly Elizabeth Boyle, . . . . .	Spivey, Kingman
Judith Rae Briggs, . . . . .	Hope, Arkansas
May Brookshier, . . . . .	Chillicothe, Missouri
Vivian Eves Brothers, . . . . .	Agra, Phillips
Hazel Elizabeth Brown, . . . . .	Chester, Nebraska
Helen Mildred Brown, . . . . .	Holton, Jackson
Lora Kathryn Brown, . . . . .	Dwight, Morris
Mildred Browning, . . . . .	Linwood, Leavenworth
Nettie Brush, . . . . .	Newton, Harvey
Hallie May Bryson, . . . . .	Manhattan, Riley
Lillian Anna Buchheim, . . . . .	Winkler, Riley
Elizabeth Burnham, . . . . .	Kansas City, Wyandotte
Irene Mary Barrett, . . . . .	Manhattan, Riley
Evangeline Casto, . . . . .	Wellsville, Franklin
Josephine Chamberlain, . . . . .	Clarendon, Texas
Doris Etta Chase, . . . . .	Hiawatha, Brown
Blanche Clark, . . . . .	Eskridge, Wabaunsee
Rachel Clark, . . . . .	Eskridge, Wabaunsee
Myrtle Antonia Collins, . . . . .	Essex, Iowa
Vesta Vine Cool, . . . . .	Glasco, Cloud
Alva Lee Cooper, . . . . .	Olathe, Johnson
Margaret Anna Couch, . . . . .	Phillipsburg, Phillips
Alice Marjorie Crichton, . . . . .	Topeka, Shawnee
Leslie Crittenden, . . . . .	Coolidge, Hamilton
Esther Curtis, . . . . .	Manhattan, Riley
Ruth Christina Daum, . . . . .	Eureka, Greenwood
Elma Mary Davidson, . . . . .	Yates Center, Woodson
Margaret May DeForest, . . . . .	Lawrence, Douglas
Janie DePriest, . . . . .	Salina, Saline
Mrs. Ellen Josephine Dwyer, . . . . .	Scottsville, Mitchell
Mabel Ruth Edmond, . . . . .	Kansas City, Missouri
Leuelia Einsel, . . . . .	Greensburg, Kiowa
Emma Gertrude Ellersick, . . . . .	Comstock, Nebraska
Emma Juanita Engle, . . . . .	Abilene, Dickinson
Alma Ruth Ennefer, . . . . .	Pleasanton, Linn
Anna Dorothea Ernsting, . . . . .	Ellinwood, Barton
Rosanna Farquhar, . . . . .	Manhattan, Riley
Katherine Faulconer, . . . . .	Clay Center, Clay
Christina Grace Figley, . . . . .	Kansas City, Wyandotte
Mary Elizabeth Fink, . . . . .	Formoso, Jewell
Marjorie Adelaide Garnett, . . . . .	Topeka, Shawnee
Helen Rae Garvie, . . . . .	Abilene, Dickinson
Edythe Ione Gulliland, . . . . .	Auburn, Nebraska
Florence Goddard, . . . . .	Minneapolis, Ottawa
Altha Teresa Goodwyn, . . . . .	Minneapolis, Ottawa
Stella Jane Gould, . . . . .	Wilroads, Ford
Maude Rosaline Greub, . . . . .	Kirwin, Phillips



# List of Students

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## FRESHMEN—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Hazel Kathryn Groff, . . . . .	Nortonville, Jefferson
Dorothy Hadley, . . . . .	Topeka, Shawnee
Gertrude Hale, . . . . .	Lebanon, Smith
Charlotte Hall, . . . . .	Ohllicoth, Missouri
Cleo Elizabeth Hamilton, . . . . .	Little River, Rice
Elizabeth Lillian Hargrave, . . . . .	Richmond, Franklin
Zora Harris, . . . . .	Manhattan, Riley
Irene Held, . . . . .	Clay Center, Clay
Helen Florence Henry, . . . . .	Udall, Cowley
Mabel Ruth Henry, . . . . .	Junction City, Geary
Frances Hildebrand, . . . . .	Coffeyville, Montgomery
Flora Marie Hill, . . . . .	Lubbock, Texas
Mabel Ellen Hinds, . . . . .	Pleasanton, Linn
Nellie Maria Hord, . . . . .	Colony, Anderson
Mabel Donna Howard, . . . . .	Cottonwood Falls, Chase
Ellen Elizabeth Howell, . . . . .	Garnett, Anderson
Ruth Kathrina Huff, . . . . .	Chapman, Dickinson
Ethel Rebecca Hunt, . . . . .	Irving, Marshall
Edith Brooks Inskeep, . . . . .	Manhattan, Riley
Pansy Jackson, . . . . .	Manhattan, Riley
Celia Belletta Johnson, . . . . .	Dresden, Decatur
Estella Johnson, . . . . .	Highland, Doniphan
Hazel Ruth Johnston, . . . . .	Wichita, Sedgwick
Marian Bell Keys, . . . . .	Enid, Oklahoma
Hazel Elizabeth Kiser, . . . . .	Udall, Cowley
Evelyn Nellie Kizer, . . . . .	Manhattan, Riley
Hazel Beatrice Kramer, . . . . .	Auburn, Shawnee
Amy Alice Lamberson, . . . . .	Lyons, Rice
Lottie Lasswell, . . . . .	Havensville, Pottawatomie
Mayme Elizabeth Linten, . . . . .	Denison, Jackson
Jessie May Littrell, . . . . .	Nelson, Nebraska
Emily Lofinck, . . . . .	Manhattan, Riley
Louella Elizabeth McCall, . . . . .	Wa Keeney, Trego
Majorie McClure, . . . . .	Blue Mound, Linn
Agnes May McCorkle, . . . . .	Holton, Jackson
Cynthia Ellen McGuire, . . . . .	Manhattan, Riley
Bernice Elvira McKeever, . . . . .	Topeka, Shawnee
Beulah Lillis McNall, . . . . .	Gaylord, Smith
Mary Mack, . . . . .	Manhattan, Riley
Gladys Magill, . . . . .	Wichita, Sedgwick
Lethe Marshall, . . . . .	Manhattan, Riley
Thelma Eloise Marty, . . . . .	Smith Center, Smith
Ada Valentine Mathes, . . . . .	Kinsley, Edwards
Kittie May, . . . . .	La Cygne, Linn
Tressie Edna May, . . . . .	Manhattan, Riley
Bernice Michael, . . . . .	St. Joseph, Missouri
Grace Hilton Willis Middleton, . . . . .	Kansas City, Missouri
Agnes Christina Miller, . . . . .	Udall, Cowley
Katherine Miller, . . . . .	Abbeyville, Reno
Lucille Mills, . . . . .	Topeka, Shawnee
Goldie Elizabeth Mitchell, . . . . .	Brookville, Saline
Stella Eliza Mitchell, . . . . .	Valley Falls, Jefferson
Harriett Plummer Morris, . . . . .	Wichita, Sedgwick
Laura Mueller, . . . . .	Wichita, Sedgwick
Florence Alberta Musser, . . . . .	Abilene, Dickinson
Buena Myers, . . . . .	Clay Center, Clay
Anna Monroe Neer, . . . . .	Cambridge, Cowley
Junia Edith Nelson, . . . . .	Wamego, Pottawatomie
Ninetta Marie Neusbaum, . . . . .	Manhattan, Riley
Bertha Estella Newlin, . . . . .	Wetmore, Nemaha
Mary Francis Nicolay, . . . . .	Manhattan, Riley
Lettie Maybelle Noyce, . . . . .	Stockton, Rooks
Ruth Elizabeth Orr, . . . . .	Manhattan, Riley
Caroline Roberts Packard, . . . . .	Manhattan, Riley
Edith Parkhurst, . . . . .	Kinsley, Edwards
Anna Lillian Patton, . . . . .	Manhattan, Riley
Clara Viola Peterson, . . . . .	Essex, Iowa
Alma Luella Pile, . . . . .	Arkalon, Seward
Lael Louise Porter, . . . . .	Deadwood, South Dakota
Nina Mae Powell, . . . . .	Athol, Smith
Elva Quisenberry, . . . . .	Lyons, Rice
Laura Mary Ramsey, . . . . .	Topeka, Shawnee
Ruth Bernita Rathbone, . . . . .	Manhattan, Riley
Florence Eulalia Ridings, . . . . .	Solomon, Dickinson
Gretta Roach, . . . . .	Manhattan, Riley
Mildred Robinson, . . . . .	Salina, Saline
Fern Martha Roderick, . . . . .	Attica, Harper
Bertha Root, . . . . .	Brookville, Saline
Mabel Letitia Root, . . . . .	Centralia, Nemaha

## FRESHMEN—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Carrie Ruffner, . . . . .	Beloit, Mitchell
Anita Russell, . . . . .	Kansas City, Wyandotte
Florence Lorena Russell, . . . . .	Stafford, Stafford
Marie Schultheis, . . . . .	Hoxie, Sheridan
Bessie Melorah Scranton, . . . . .	Syracuse, Hamilton
Edith Harriett Simpson, . . . . .	Kansas City, <i>Missouri</i>
Maud Ernestine Sjolander, . . . . .	Topeka, Shawnee
Georgia Yantis Sloan, . . . . .	Beloit, Mitchell
Mildred Emily Smith, . . . . .	Burlingame, Osage
Bernice Barbara Soller, . . . . .	Washington, Washington
Mary Ruth Stevenson, . . . . .	Paola, Miami
Lulu Eleanor Stewart, . . . . .	Independence, Montgomery
Amelia Cora Still, . . . . .	Manhattan, Riley
Edna Mae Stines, . . . . .	Yates Center, Woodson
Viola Stockwell, . . . . .	Larned, Pawnee
Ruth LaVerne Stover, . . . . .	Lincoln Lincoln
Iva Viola Strebel, . . . . .	Alton, Osborne
Lena Louise Strieby, . . . . .	Burlington, Coffey
Josephine Sublette, . . . . .	Topeka, Shawnee
Alice Mae Sweet, . . . . .	Burlington, Coffey
Corinne Sweet, . . . . .	Holton, Jackson
Edith Tempero, . . . . .	Clay Center, Clay
Madge Rector Thompson, . . . . .	Hill City, Graham
Magdalen Florence Thompson, . . . . .	Alma, Wabaunsee
Daisy Bell Tolbert, . . . . .	Manhattan, Riley
Martha Byrd Tunstall, . . . . .	Manhattan, Riley
Adelaide Rebecca Updegraff, . . . . .	Maplehill, Wabaunsee
Cynova Eunice Walker, . . . . .	St. Joseph, <i>Missouri</i>
Frances Josephine Walsh, . . . . .	Clay Center, Clay
Harriett Lanette Ward, . . . . .	Osborne, Osborne
Charlotte Pearl Wartenbee, . . . . .	Liberal, Seward
Marguerite Marie Weaver, . . . . .	Alma, Wabaunsee
Mary Elizabeth Weible, . . . . .	Topeka, Shawnee
Pearl Elizabeth Welty, . . . . .	Sterling, Rice
Aline Alexander Williams, . . . . .	Wichita, Sedgwick
Nina Marie Williams, . . . . .	Winfield, Cowley
Genevieve Wilson, . . . . .	Kansas City, Wyandotte
Vida Neil Wilson, . . . . .	Formoso, Jewell
Elsie Wolfenbarger, . . . . .	Winkler, Riley
Fay Emma Wright, . . . . .	Muskogee, <i>Oklahoma</i>
Edith May Yoho, . . . . .	Pratt, Pratt
Matilda Louisa Ziller, . . . . .	Manhattan, Riley

## GENERAL SCIENCE

Clara Mildred Abel, . . . . .	Ness City, Ness
Ora Roland Abel, . . . . .	Ness City, Ness
John William Barker, . . . . .	Pratt, Pratt
Hollis Lee Roy Barnes, . . . . .	Agra, Phillips
Oliver Wendel Broberg, . . . . .	Manhattan, Riley
Emma Alina Brosh, . . . . .	Narka, Republic
Harry Ray Bryson, . . . . .	Manhattan, Riley
Paul David Buchanan, . . . . .	Chanute, Neosho
Vilona Cutler, . . . . .	Anthony, Harper
Guy Delaney, . . . . .	Waterville, Marshall
William Taylor Douglas, . . . . .	Jewell City, Jewell
Lewis Albert Dubbs, . . . . .	Ransom, Ness
John Burton Elliot, . . . . .	Manhattan, Riley
Herbert Linwood Freese, . . . . .	Wakefield, Clay
Effie Marial Hand, . . . . .	Clay Center, Clay
John Benjamin Hinds, . . . . .	Pleasanton, Linn
Leona Mae Hoag, . . . . .	Mankato, Jewell
Anna Howard, . . . . .	Manhattan, Riley
John Oscar Johnson, . . . . .	Dwight, Morris
Philip Alexander Kennicott, . . . . .	Woodbine, Dickinson
Brice John King, . . . . .	Centralia, Nemaha
Russell Orlando Lowrance, . . . . .	Thayer, Neosho
Ralph Francois Lucier, . . . . .	Abilene, Dickinson
Scott Rayden MacLeod, . . . . .	Holton, Jackson
James Makins, . . . . .	Abilene, Dickinson
Walter Matteson, . . . . .	Nowata, <i>Oklahoma</i>
Charles Curtis May, . . . . .	Holton, Jackson
Anna Rose Oberhelman, . . . . .	Leonardville, Riley
William Byron Orange, . . . . .	Manhattan, Riley
Vera Grace Peake, . . . . .	Belleville, Republic
Harry Philip Resnick, . . . . .	Newark, <i>New Jersey</i>
Julien Van Cleave Root, . . . . .	Topeka, Shawnee
Iris Russell, . . . . .	Kansas City, Wyandotte
Phil Alvin Russell, . . . . .	Paola, Miami

## FRESHMEN—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Elwin Leslie Smith, . . . . .	Colony, Anderson
Roy Sterling, . . . . .	Clay Center, Clay
Mary Fidelia Taylor, . . . . .	Newton, Harvey
Carl Morgan Thomas, . . . . .	Portis, Osborne
Insley Johnston Walker, . . . . .	Wichita, Sedgwick
Merl Watson, . . . . .	Clafin, Barton
Joe Weaver, . . . . .	Concordia, Cloud
Eva Emmaline Wood, . . . . .	Manhattan, Riley
John Clendenin Wood, . . . . .	Anthony, Harper

## INDUSTRIAL JOURNALISM

Thompson Fulton Blackburn, . . . . .	Anthony, Harper
William Edwin Burwell, . . . . .	Jarbalo, Leavenworth
Grover Samuel Easter, . . . . .	Abilene, Dickinson
Paul Faulconer, . . . . .	Clay Center, Clay
Ralph Harold Heppe, . . . . .	Wichita, Sedgwick
William Brown Kappel, . . . . .	Glasco, Cloud
John Edgar McHarg, . . . . .	Wichita, Sedgwick
Everett Gladstone Shimmin, . . . . .	Manhattan, Riley
Charles Leroy Thomas, . . . . .	Manhattan, Riley

## THIRD YEAR, SCHOOL OF AGRICULTURE

Kate Littelton Briggs, . . . . .	Olathe, Johnson
Edith Myrtle Limbocker, . . . . .	Manhattan, Riley
Alice Williams, . . . . .	Sylvan Grove, Lincoln

## SECOND YEAR, SCHOOL OF AGRICULTURE

Daniel Abel, . . . . .	Ness City, Ness
Harry Hamilton Bearman, . . . . .	Johnson, Stanton
Elmer George Becker, . . . . .	Meriden, Jefferson
Arthur Ernest Bentley, . . . . .	Yukon, Oklahoma
Alma Franc Bishop, . . . . .	Glasco, Cloud
David Loring Cahill, . . . . .	Lucas, Russell
Lola Anna Campbell, . . . . .	Garden City, Finney
Lou Campbell, . . . . .	Mapleton, Bourbon
Letha Viola Cooper, . . . . .	Manhattan, Riley
Franklin Dave Davis, . . . . .	St. George, Pottawatomie
May Dewey, . . . . .	Manhattan, Riley
George Edward Fawl, . . . . .	Silver Lake, Shawnee
Frank Harold Gulick, . . . . .	Winfield, Cowley
Imo Jessie Hays, . . . . .	Manhattan, Riley
Henry Glenn Hollister, . . . . .	Cleburne, Riley
Madge Eleva Hixon, . . . . .	Manhattan, Riley
Hattie Genevieve Jackson, . . . . .	Manhattan, Riley
Otto Fred Richard Jacobs, . . . . .	Luplingen, Prussia
Donald Grant Krudop, . . . . .	Manhattan, Riley
Lillie Loy, . . . . .	Vesper, Lincoln
Don McCormick, . . . . .	Zeandale, Riley
Foster Morton, . . . . .	Green, Clay
Marie Elizabeth Nauman, . . . . .	Kinsley, Edwards
Edwin Harold Patterson, . . . . .	Manhattan, Riley
Thomas Floyd Ratcliff, . . . . .	Dexter, Cowley
William Dennis Scully, . . . . .	Belvue, Pottawatomie
Almeda Smith, . . . . .	Manhattan, Riley
Newton Andrey Smith, . . . . .	Farlington, Crawford
Donald Cheney Thayer, . . . . .	Manhattan, Riley
Jesse Collins Wingfield, . . . . .	Junction City, Geary
Harry Palmer Witham, . . . . .	Manhattan, Riley
Mabel Claire Witt, . . . . .	Chanute, Neosho

## FIRST YEAR, SCHOOL OF AGRICULTURE

Joseph Leo Atkinson, . . . . .	Plymouth, Lyon
Milly Anderson, . . . . .	Ashland, Clark
Laura Gertrude Andrews, . . . . .	Hansford, Texas
Otto Curt Balzer, . . . . .	Inman, McPherson
Sheridan Edwin Banks, . . . . .	Milton, Kentucky
Forrest Wilbur Barber, . . . . .	Manhattan, Riley
Thurman Bryan Barker, . . . . .	Bethel, Wyandotte
Harold Leigh Baum, . . . . .	Phillipsburg, Phillips
Emma Elizabeth Bennett, . . . . .	Soldier, Jackson
John William Bierer, jr., . . . . .	Wichita, Sedgwick
Anna Pearle Biggs, . . . . .	Severy, Greenwood
John Oliver Bircher, . . . . .	Kanopolis, Ellsworth

## FIRST YEAR, SCHOOL OF AGRICULTURE—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Lee Bonar, . . . . .	Valley Falls, Jefferson
Walter Oscar Bowell, . . . . .	Kensington, Smith
Ruth Mae Bowers, . . . . .	Holcomb, Finney
Ruth Hazel Branch, . . . . .	Manhattan, Riley
Ed Earl Bright, . . . . .	Morrowville, Washington
Clarence Curtis Brown, . . . . .	Dwight, Morris
Floyd Brown, . . . . .	Sylvan Grove, Lincoln
John David Brown, . . . . .	Dinas, Wallace
James Warren Callahan, . . . . .	Wichita, Sedgwick
Jamie Irene Cameron, . . . . .	Junction City, Geary
Violet Christina Carlson, . . . . .	Jamestown, Cloud
Hobart Zenas Cammack, . . . . .	Manhattan, Riley
Chester Mont Carpenter, . . . . .	Haviland, Kiowa
Wallace Clapp, . . . . .	Logan, Phillips
Everett Pardon Colburn, . . . . .	Manhattan, Riley
John Warren Conrow, . . . . .	Manhattan, Riley
Earl Bradley Cory, . . . . .	Belleville, Republic
Samuel Cowan, . . . . .	Manhattan, Riley
Emery Melborn Cox, . . . . .	White City, Morris
Gladys Anna Craig, . . . . .	Manhattan, Riley
Ada Elnora Crottinger, . . . . .	Manhattan, Riley
Verne Lloyd Culver, . . . . .	Wichita, Sedgwick
Dexter Verrill Daggett, . . . . .	Howard, Elk
Ralph Morgan Davidson, . . . . .	Topeka, Shawnee
Ruth Davies, . . . . .	Arkalon, Seward
Orrin Leonard Davis, . . . . .	Salina, Saline
George Norton Dearden, . . . . .	Mayetta, Jackson
Emma Martha Delfs, . . . . .	Inman, McPherson
Henry Delfs, . . . . .	Americus, Lyon
Carl Emerson Depue, . . . . .	Drexel, Missouri
Porter Mayer Gobbs, . . . . .	Burden, Cowley
David Edgar, . . . . .	Beaumont, Butler
John Thomas Evans, . . . . .	New York, N. Y.
Ross Ray Everts, . . . . .	Hiawatha, Brown
Stephen LeRoy Ferguson, . . . . .	Cave, Gray
Hugh Miller Freeman, . . . . .	Wichita, Sedgwick
Bertha Marie Frey, . . . . .	Manhattan, Riley
Archie Clark Fry, . . . . .	Valley Center, Sedgwick
Horace Fullerton, . . . . .	Hazleton, Barber
Lester Frank Gfeller, . . . . .	Junction City, Geary
Rhea Gilbert, . . . . .	Medicine Lodge, Barber
Charles Howard Good, . . . . .	Perry, Jefferson
Ethel Grace Gorton, . . . . .	Manhattan, Riley
Fannie Harriet Gorton, . . . . .	Manhattan, Riley
John Byron Gorton, . . . . .	Manhattan, Riley
Merrill Bird Gorton, . . . . .	Manhattan, Riley
Wesley Clark Graftham, . . . . .	Homewood, Franklin
Will Ely Grant, . . . . .	Manhattan, Riley
Basil Ambrose Green, . . . . .	Mankato, Jewell
Lily Elizabeth Guilfoil, . . . . .	Wamego, Pottawatomie
William Guilfoil, . . . . .	Wamego, Pottawatomie
Elsie Edgar Gulick, . . . . .	Winfield, Cowley
Elta Elizabeth Haege, . . . . .	Manhattan, Riley
Ford Haggerty, . . . . .	Greensburg, Kiowa
Claude Hayes Halsey, . . . . .	Sharon Springs, Wallace
Marie Halsey, . . . . .	Sharon Springs, Wallace
Wayne Miles Halsey, . . . . .	Sharon Springs, Wallace
Walter Roy Harder, . . . . .	Minneapolis, Ottawa
Loyal Harris, . . . . .	Manhattan, Riley
Roger Harrison, . . . . .	Riley, Riley
Leroy Neal Hartman, . . . . .	Scottsville, Mitchell
Maud Ellen Hatfield, . . . . .	Manhattan, Riley
Floyd Elvin Hays, . . . . .	Stockton, Rooks
Carl Wilhelm Hellwig, . . . . .	Oswego, Labette
Noah Zale Herde, . . . . .	Hoyt, Jackson
Middleton Boriden Herrell, . . . . .	Urich, Missouri
Irwin Lee Heth, . . . . .	Dover, Shawnee
Howard Holt Hill, . . . . .	Burlington, Coffey
Ross Wayne Hill, . . . . .	Manhattan, Riley
Ward Lucas Hill, . . . . .	Manhattan, Riley
Ruben Earl Hixon, . . . . .	Manhattan, Riley
Clarence David Hodge, . . . . .	Parsons, Labette
Ercil Addison Hoke, . . . . .	Manhattan, Riley
Maurice Edward Hooper, . . . . .	Junction City, Geary
Ruth Emma Houk, . . . . .	Americus, Lyon
Floyd Edgar Hull, . . . . .	Portis, Osborne
Solomon Willard Jackson, . . . . .	Manhattan, Riley
Irl Redmon John, . . . . .	Manhattan, Riley
Ward Reynold Johnston, . . . . .	Manhattan, Riley

## FIRST YEAR, SCHOOL OF AGRICULTURE—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Noble Jones, . . . . .	Reading, Lyon
William McKinley Kasl, . . . . .	Concordia, Cloud
Lawrence Woodard Kennedy, . . . . .	Lawrence, Douglas
Milton Kenoly, . . . . .	Neodesha, Wilson
Will Steve Kern, . . . . .	Fort Madison, Iowa
Leland Bryan Kilmer, . . . . .	Bird City, Cheyenne
Dorothy Kimball, . . . . .	Manhattan, Riley
George Brent Kimport, . . . . .	Dellvale, Norton
John William Kirwan, . . . . .	Purcell, Doniphan
Clarence Albert Klusman, . . . . .	Lenexa, Johnson
Walter Kramer, . . . . .	Auburn, Shawnee
Walter Evan Kroth, . . . . .	Soldier, Jackson
Harry Benjamin Landis, . . . . .	Kiowa, Barber
Ellen Onedia Larsen, . . . . .	Norway, Republic
Carl Franklin Lasswell, . . . . .	Rossville, Shawnee
Sarah Letha Lasswell, . . . . .	Havensville, Pottawatomie
Jay Oscar Lee, . . . . .	Ness City, Ness
Albert Lembright, . . . . .	Dodge City, Ford
Jay Van Lindley, . . . . .	Eudora, Douglas
Clyde Long, . . . . .	Manhattan, Riley
Josie Long, . . . . .	Manhattan, Riley
Marie Long, . . . . .	Manhattan, Riley
Eugene Sidney Lyons, . . . . .	Lawrence, Douglas
Leo Plato McClure, . . . . .	Havana, Montgomery
Ross Isaac McCollough, . . . . .	Rossville, Shawnee
Charles William McGuire, . . . . .	Sharon, Barber
Joe Alexander McGuire, . . . . .	Manhattan, Riley
Ray Edward McMoran, . . . . .	Etina, Barber
William Mackender, . . . . .	Riley, Riley
Rose Malicky, . . . . .	Oketo, Marshall
Louise Markley, . . . . .	Bennington, Ottawa
Chauncy Merritt Matthews, . . . . .	Manhattan, Riley
Harvey Paul Matney, . . . . .	Wichita, Sedgwick
Ralph Waldo May, . . . . .	Williamstown, Jefferson
William Harold Medill, . . . . .	Leavenworth, Leavenworth
Martin Raymond Meyer, . . . . .	Clifton, Washington
Halford Ernest Moody, . . . . .	Riley, Riley
Ora Moody, . . . . .	Fort Scott, Bourbon
Roscoe Moore, . . . . .	Great Bend, Barton
John Pratt Morris, . . . . .	Emporia, Lyon
Arthur Lester Morton, . . . . .	Fall River, Greenwood
Harry Asa Muir, . . . . .	Salina, Saline
William August Naher, . . . . .	Kansas City, Missouri
Howard Leigh Neusbaum, . . . . .	Manhattan, Riley
Glen Gilbert Nicholas, . . . . .	Havensville, Pottawatomie
Lysle Clifford Noffsinger, . . . . .	Osborne, Osborne
Walter George Oehrle, . . . . .	Lawrence, Douglas
Nellie Orr, . . . . .	Manhattan, Riley
Albert Victor Pacey, . . . . .	Miltonville, Cloud
Leonard Pacey, . . . . .	Miltonville, Cloud
Edward Parrish, . . . . .	Manhattan, Riley
Ivan Thomas Peppiatt, . . . . .	Ellsworth, Ellsworth
Gertrude Pfeil, . . . . .	Manhattan, Riley
Irene Pieratt, . . . . .	Hartford, Lyon
Paul Norman Pieratt, . . . . .	Hartford, Lyon
Mildred Gertrude Pollock, . . . . .	Burlington, Coffey
Harold William Poort, . . . . .	Topeka, Shawnee
Mayme Fredareca Postier, . . . . .	Inman, McPherson
Jay Earl Potter, . . . . .	Barnes, Washington
Jennie Mary Prebyl, . . . . .	Oketo, Marshall
George Edward Prewitt, . . . . .	Kansas City, Wyandotte
John Michael Quinn, . . . . .	Salina, Saline
Karl Spangler Quisenberry, . . . . .	Newton, Harvey
Irvan William Rahe, . . . . .	Winkler, Riley
Olga Jennette Rall, . . . . .	Hutchinson, Reno
Lloyd Everett Rains, . . . . .	Manhattan, Riley
Don Winans Ray, . . . . .	Garnett, Anderson
Randall Reid, . . . . .	Collyer, Trego
Zades Richards, . . . . .	Manhattan, Riley
Fred Lokke Ross, . . . . .	Montrose, Jewell
Guy Rudy, . . . . .	Manhattan, Riley
George Eddie Ruggles, . . . . .	Guliford, Wilson
Albert Henry Saxton, . . . . .	Everest, Brown
Mary Hazel Schafer, . . . . .	Manhattan, Riley
Vernon Scott, . . . . .	Montezuma, Gray
James Jacob Seright, . . . . .	Lucas, Russell
James Frank Smid, . . . . .	Fowler, Meade
Joseph Earl Smid, . . . . .	Fowler, Meade
Harry McMillen Smith, . . . . .	Codell, Rooks

FIRST YEAR, SCHOOL OF AGRICULTURE—*continued.*

<i>Names</i>	<i>Post office (county or state)</i>
Joseph Lucien Snyder, . . . . .	Manhattan, Riley
Phillip Sylvanis Stephens, . . . . .	Horace, Greeley
Fred Stephenson, . . . . .	Clements, Chase
Ward Clinton Stout, . . . . .	Arkalon, Seward
George Ambrose Stuck, . . . . .	Manhattan, Riley
Abbie Swafford, . . . . .	Manhattan, Riley
Herbert Clifford Sylvester, . . . . .	Goodland, Sherman
Roy Charles Taft, . . . . .	Hanover, Washington
Abraham McKinley Tidball, . . . . .	Wa Keeney, Trego
Charles Marion Tillotson, . . . . .	El Dorado, Butler
Frank Ernest Trablik, . . . . .	Goodland, Sherman
Herbert Henry Uhrig, . . . . .	Wamego, Pottawatomie
Charlie William Underwood, . . . . .	Lawrence, Douglas
Cecil Van Meter, . . . . .	St. Joseph, <i>Missouri</i>
Leslie Wayne Vawter, . . . . .	Carbondale, Osage
Emmet Daniel Vilander, . . . . .	Manhattan, Riley
Grace Wagner, . . . . .	Junction City, Geary
John Everett Weeks, . . . . .	Belvue, Pottawatomie
Cecil Clayton Willars, . . . . .	Glasco, Cloud
Frank Edward Williams, . . . . .	Harper, Harper
Oliver Brown Wilson, . . . . .	Topeka, Shawnee
Clara Rebecca Wismer, . . . . .	Formoso, Jewell
Jessie Marsdon Witham, . . . . .	Manhattan, Riley
Frank Weeks Wood, . . . . .	Reading, Lyon
Hubert Steven Woodard, . . . . .	Eudora, Douglas
George Wendell Zeller, . . . . .	Manhattan, Riley
Lulu May Zeller, . . . . .	Manhattan, Riley
Zell Albert Zordel, . . . . .	Ransom, Ness

## SPECIAL, SCHOOL OF AGRICULTURE

Clinton Conrad Albers, . . . . .	Hargrave, Rush
Dora Alley, . . . . .	Wichita, Sedgwick
Leland Carpenter Allis, . . . . .	Manhattan, Riley
Eva Emma Anderson, . . . . .	Beattie, Marshall
John August Anderson, . . . . .	Ottawa, Franklin
Myrtle Christine Anderson, . . . . .	Vesper, Lincoln
Esther Etta Andrews, . . . . .	Manhattan, Riley
John Wendell Andrews, . . . . .	Manhattan, Riley
Ethel Arnold, . . . . .	Manhattan, Riley
William Allen Atchison, . . . . .	Wakarusa, Shawnee
Harry Austin, . . . . .	Manhattan, Riley
Lillian Belle Baker, . . . . .	Manhattan, Riley
Ralph Vernon Baker, . . . . .	Cherryvale, Montgomery
Alta Malinda Balch, . . . . .	Formoso, Jewell
Maye Balch, . . . . .	Formoso, Jewell
Malvina Maude Baldrige, . . . . .	Manhattan, Riley
Lowell Edwin Baldwin, . . . . .	Manhattan, Riley
Herbert Bales, . . . . .	Manhattan, Riley
Nancy May Barhite, . . . . .	Manhattan, Riley
Theodore Lawrence Bayer, . . . . .	Yates Center, Woodson
Arthur Joseph Bayles, . . . . .	Manhattan, Riley
Esther Grace Bayles, . . . . .	Manhattan, Riley
Montie Melvel Beaman, . . . . .	Macksville, Stafford
George Bear, . . . . .	Manhattan, Riley
Merle Benjamin Bevers, . . . . .	Hamilton, Greenwood
Don Henry Bell, . . . . .	Neodesha, Wilson
Selestine Robinson Biggins, . . . . .	Dallas, <i>Texas</i>
Harold Bixby, . . . . .	Manhattan, Riley
Avis Blain, . . . . .	Manhattan, Riley
Foster Raymond Blockolsky, . . . . .	Manhattan, Riley
Elna Elizabeth Blom, . . . . .	Concordia, Cloud
Harold Blood, . . . . .	Wichita, Sedgwick
Joseph Alvin Bogue, . . . . .	Glasco, Cloud
Nora Margaret Boettcher, . . . . .	Winkler, Riley
Lillian Bowen, . . . . .	Arnold, Ness
Arthur William Boyer, . . . . .	Scranton, Osage
Helen Marie Brady, . . . . .	Manhattan, Riley
Martha Inez Brandt, . . . . .	Manhattan, Riley
Herman William Brauer, . . . . .	Herington, Dickinson
Palmer Fair Bressler, . . . . .	Manhattan, Riley
Arthur Hayes Brewer, . . . . .	Manhattan, Riley
Don Britton, . . . . .	Mapleton, Bourbon
Fred Burt Broadbent, . . . . .	Beloit, Mitchell
Irene Dale Brooks, . . . . .	Parsons, Labette
Zada Agnes Brooks, . . . . .	Tescott, Ottawa
Mrs. Ella Hutchason Brown, . . . . .	Manhattan, Riley
Herbert Norton Brown, . . . . .	Simpson, Mitchell
Arthur Browne, . . . . .	Burdett, Pawnee

## SPECIAL, SCHOOL OF AGRICULTURE—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Richard Hoag Browne, . . . . .	Burdett, Pawnee
Genevieve Vador Bruce, . . . . .	Manhattan, Riley
Arthur Newton Burditt, . . . . .	Ness City, Ness
Martha Marie Burnside, . . . . .	Junction City, Geary
Noel Adrain Burt, . . . . .	Hallet, Hodgeman
Charles LeRoy Caldwell, . . . . .	Grinnell, Gove
Julia Helen Caldwell, . . . . .	Oswego, Labette
John Charles Campbell, . . . . .	Manhattan, Riley
Levah Campbell, . . . . .	Manhattan, Riley
Lysle McCord Campbell, . . . . .	Manhattan, Riley
Evelyn Dulcina Carey, . . . . .	Manhattan, Riley
Helen Juanita Carey, . . . . .	Manhattan, Riley
Lucile Margaret Carey, . . . . .	Manhattan, Riley
Carl Victor Carlson, . . . . .	Manhattan, Riley
Otto Carlson, . . . . .	Manhattan, Riley
Teckla Christine Carlson, . . . . .	Olsburg, Pottawatomie
Clyde Eugene Cave, . . . . .	Wichita, Sedgwick
Glenn Dell Chartier, . . . . .	Clyde, Cloud
Sara Chase, . . . . .	Manhattan, Riley
Francis Neuman Cheatum, . . . . .	Langdon, Reno
Robert Hamlen Chesney, . . . . .	El Dorado, Butler
Edwin Christian, . . . . .	Iola, Allen
Merrill Aikman Cissell, . . . . .	Manhattan, Riley
Benjamin Finley Clapham, . . . . .	Lane, Franklin
Frank Lester Clark, . . . . .	Riley, Riley
Forrest Edward Clark, . . . . .	Manhattan, Riley
Melvil Cleland, . . . . .	Manhattan, Riley
Tracy Cleland, . . . . .	Manhattan, Riley
Milton Livingston Coe, . . . . .	Manhattan, Riley
Russell Fesler Coffey, . . . . .	Geneva, Allen
Alda Conrow, . . . . .	Manhattan, Riley
Arthur Everett Cook, . . . . .	Russell, Russell
Robert Frances Copple, . . . . .	Glasco, Cloud
Alta Mamie Couch, . . . . .	Gardner, Johnson
Harry Lance Crittenden, . . . . .	Coolidge, Hamilton
Donald Winfield Cronkite, . . . . .	St. Joseph, Missouri
Walter Crotts, . . . . .	Woodsdale, Stevens
Charles Frederick Croyle, . . . . .	New Cambria, Saline
Sylvester Owen Cummings, . . . . .	Phillipsburg, Phillips
David Earl Curry, . . . . .	Dunavant, Jefferson
Dora Fern Curtis, . . . . .	Manhattan, Riley
William Henry Curtis, . . . . .	Ogden, Riley
Mary Danner, . . . . .	Topeka, Shawnee
Kathryne Dappen, . . . . .	Lost Springs, Marion
Price Davies, . . . . .	Arkalon, Seward
Homer DeWitt Davis, . . . . .	Riley, Riley
Oscar Nuten Davis, . . . . .	Altamont, Labette
Pearl Robert Davis, . . . . .	Manhattan, Riley
Raymond Clarence Davis, . . . . .	Manhattan, Riley
Russell Gordon Davis, . . . . .	Bronson, Bourbon
George DeBaum, . . . . .	Bushong, Lyon
Otto Delfs, . . . . .	Inman, McPherson
Arthur Reginald Denman, . . . . .	Manhattan, Riley
Eliza Bertha Dennett, . . . . .	Harper, Harper
Floyd Everett DeShon, . . . . .	Logan, Phillips
Frank Nelson Dick, . . . . .	Parsons, Labette
Lovie Elizabeth Dittman, . . . . .	Downs, Osborne
John Julius Doeber, . . . . .	Manhattan, Riley
John Dow, . . . . .	Emporia, Lyon
Harry Leslie Drown, . . . . .	Manhattan, Riley
Dora Frances Duffield, . . . . .	Manhattan, Riley
Robert LeRoy Duffy, . . . . .	Manhattan, Riley
Merton Edward Dull, . . . . .	Westphalia, Anderson
John Donley Dunlap, . . . . .	Eureka, Greenwood
Nadia Dunn, . . . . .	Manhattan, Riley
Chester Franklin Ebey, . . . . .	Topeka, Shawnee
John Fredrick Eggeman, . . . . .	Manchester, Oklahoma
Charles Arthur Ellersick, . . . . .	Comstock, Nebraska
Maggie Ellis, . . . . .	Westmoreland, Pottawatomie
James Culp Elsea, . . . . .	Lake City, Barber
John Errebo, . . . . .	Vesper, Lincoln
Martha Errebo, . . . . .	Vesper, Lincoln
Mary Theodora Errebo, . . . . .	Vesper, Lincoln
Clarence Jinks Etherington, . . . . .	Neal, Greenwood
Grace Mirriam Ferguson, . . . . .	Manhattan, Riley
Homer Fink, . . . . .	Manhattan, Riley
Claude Charles Fish, . . . . .	La Crosse, Rush
Cora Belle Flanders, . . . . .	Ellsworth, Ellsworth
Forrest Custer Flora, . . . . .	Manhattan, Riley
Edith Louie Folger, . . . . .	Northbranch, Jewell

SPECIAL, SCHOOL OF AGRICULTURE—*continued.*

<i>Names</i>	<i>Post office (county or state)</i>
Ethel Folger, . . . . .	Northbranch, Jewell
George Adam Franz, . . . . .	Rozel, Pawnee
Charles Anthony Frankenhoff, . . . . .	Atchison, Atchison
Earl Benjamin Fulk, . . . . .	Wichita, Sedgwick
Lewis Eli Gardner, . . . . .	Manhattan, Riley
Herman Andrew Gehrke, . . . . .	Herington, Dickinson
Jesse Conrad Geiger, . . . . .	Wichita, Sedgwick
Ella Gfeller, . . . . .	Junction City, Geary
George Raymond Giles, . . . . .	Wichita, Sedgwick
Mary Emma Giles, . . . . .	Manhattan, Riley
Bernie Gleason, . . . . .	Jericho, Vermont
Estella Glogan, . . . . .	Paxico, Wabaunsee
Fred Roy Glover, . . . . .	Wamego, Pottawatomie
Ray Franklin Glover, . . . . .	Wamego, Pottawatomie
Jennie Marie Goodsheller, . . . . .	McPherson, McPherson
Albert Charles Graffham, . . . . .	Hemewood, Franklin
Jennie Grant, . . . . .	Manhattan, Riley
Mabel Bertha Green, . . . . .	Oswego, Labette
Louise Gregory, . . . . .	Manhattan, Riley
Ward Clarke Griffing, . . . . .	Manhattan, Riley
Willis Goodrich Griffing, . . . . .	Manhattan, Riley
Harold Dwight Grimes, . . . . .	Ottawa, Franklin
Laura Annie Gustafson, . . . . .	Stockdale, Riley
Benjamin John Hahne, . . . . .	Dodge City, Ford
Annie Lucile Haines, . . . . .	Chanute, Neosho
Floyd Hanna, . . . . .	Manhattan, Riley
Wayne Hanna, . . . . .	Manhattan, Riley
Frank Hansen, . . . . .	Penalosa, Kingman
Henry Edward Hanser, . . . . .	Lenexa, Johnson
Faith Hathaway Harling, . . . . .	Manhattan, Riley
Gertrude Elisabeth Harling, . . . . .	Manhattan, Riley
Jack Calvert Hart, . . . . .	Wichita, Sedgwick
Ernest Clarence Harvey, . . . . .	South Omaha, Nebraska
Freda Louise Haslam, . . . . .	Manhattan, Riley
Clifford Hazen, . . . . .	Wayne, Republic
Alfred Sidney Heard, . . . . .	Dodge City, Ford
Charles Arthur Hensleigh, . . . . .	Winchester, Jefferson
Emra Adam Hepler, . . . . .	Manhattan, Riley
Nettie Ruth Hepler, . . . . .	Greensburg, Kiowa
Chester Albert Herrick, . . . . .	Colony, Anderson
Roscoe Easter Hey, . . . . .	Manhattan, Riley
Agnes Jane Hickok, . . . . .	New Ulysses, Grant
George Henry Hill, . . . . .	Denison, Jackson
George Winfred Hinds, . . . . .	Manhattan, Riley
Agnes Hodgins, . . . . .	Belleville, Republic
Earnestine Hodgins, . . . . .	Belleville, Republic
Edna Lethe Hoke, . . . . .	Manhattan, Riley
Merton Anderson Hoke, . . . . .	Manhattan, Riley
Harry Stewart Holden, . . . . .	Topeka, Shawnee
Bertha Lydia Holladay, . . . . .	Wright, Ford
Leda Leah Holt, . . . . .	Morganville, Clay
Charles Henry Honeywell, . . . . .	Leoti, Wichita
Samuel Willet Honeywell, . . . . .	Poe, Logan
Ray Dalton Hooton, . . . . .	Garnett, Anderson
Dick Hopper, . . . . .	Manhattan, Riley
David Marion Howard, . . . . .	Manhattan, Riley
Otis Humphrey, . . . . .	Denison, Jackson
Mable Amanda Howard, . . . . .	Manhattan, Riley
Bessie Husband, . . . . .	Speed, Rooks
Rosa Mary Husband, . . . . .	Speed, Rooks
Nellie Elizabeth Hunt, . . . . .	Manhattan, Riley
Ralph Edward Hunter, . . . . .	Palmer, Washington
Howard Huston, . . . . .	Manhattan, Riley
Hortensious Lowry Isherwood, . . . . .	Carl Junction, Missouri
Samuel James, . . . . .	Riley, Riley
Vera Louise Johnsmeyer, . . . . .	Riley, Riley
Bernice Johnson, . . . . .	Manhattan, Riley
Harry Don Johnson, . . . . .	Manhattan, Riley
Huldah Dorothy Johnson, . . . . .	Marquette, McPherson
Lucrezia Johnson, . . . . .	Manhattan, Riley
Myron Johnson, . . . . .	Olathe, Johnson
Anna Marie Johnston, . . . . .	Manhattan, Riley
Raymond James Jolley, . . . . .	Manhattan, Riley
Arthur Norman Jones, . . . . .	Manhattan, Riley
Clifford Jones, . . . . .	Emporia, Lyon
Ralph Edward Jones, . . . . .	Moline, Blk
Francis Norwood Jordan, . . . . .	Manhattan, Riley
Howard Rodney Joslin, . . . . .	Lincoln, Lincoln
Horace Lyndon Kapka, . . . . .	Kansas City, Wyandotte



## SPECIAL, SCHOOL OF AGRICULTURE—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Myron Scott Kelsey, . . . . .	Topeka, Shawnee
George Ewing Kennedy, . . . . .	Manhattan, Riley
Arch Kernohan, . . . . .	Nashville, Kingman
Anna Hermina Kessler, . . . . .	Leoti, Wichita
Clare Kimport, . . . . .	Dellvale, Norton
Charles King, . . . . .	Olsburg, Pottawatomie
Jordon Carroll King, . . . . .	Manhattan, Riley
Willard Lester Kjellin, . . . . .	Garrison, Pottawatomie
Leonard Kline, . . . . .	Topeka, Shawnee
Jerry Emil Kublik, . . . . .	Caldwell, Sumner
Dan Glenn Lake, . . . . .	Lake City, Barber
Russell Lake, . . . . .	Lake City, Barber
Harry Bernard Lamer, . . . . .	Salina, Saline
Ella Luverne Landon, . . . . .	Manhattan, Riley
Clay Forrest Laude, . . . . .	Rose, Woodson
Nyle Eloise Lewallen, . . . . .	Manhattan, Riley
Chauncey Glenn Lewis, . . . . .	Phillipsburg, Phillips
Richard Thomas Lough, . . . . .	Fort Scott, Bourbon
Frank Friend Love, . . . . .	Jetmore, Hodgeman
Lyla Edith Lundberg, . . . . .	Manhattan, Riley
Clarence Marion Luse, . . . . .	Nortonville, Jefferson
Emma Ruth McClenahan, . . . . .	Manhattan, Riley
Maxine McDonald, . . . . .	Manhattan, Riley
Lester Pearl McDowell, . . . . .	Manhattan, Riley
Gertrude Elizabeth McElroy, . . . . .	Manhattan, Riley
Ernest Earl McGuire, . . . . .	Sharon, Barber
Harold Clarence McKinney, . . . . .	Dresden, Decatur
Fred McMichael, . . . . .	Plainville, Rooks
Mathew Edward McMichael, . . . . .	Plainville, Rooks
Bessie Olive McMillan, . . . . .	Home, Marshall
Elsie Faye McSparrin, . . . . .	Manhattan, Riley
Haley Myrtle McSparrin, . . . . .	Manhattan, Riley
Donald Eugene MacLeod, . . . . .	Holton, Jackson
Deyo LeRoy Magee, . . . . .	Downs, Osborne
Leo Alphonsus Magrath, . . . . .	Williamsburg, Franklin
Elva Ione Mall, . . . . .	Manhattan, Riley
Ivor Orin Mall, . . . . .	Manhattan, Riley
Earle Allen Manker, . . . . .	Manhattan, Riley
Glady's Gertrude Markley, . . . . .	Scranton, Osage
Jessie Marsh, . . . . .	Paola, Miami
Marguerite Irene Marshall, . . . . .	Clifton, Washington
Sylvester Samuel Marshall, . . . . .	Manhattan, Riley
Helen Marten, . . . . .	Leavenworth, Leavenworth
Calvin Medlin, . . . . .	Chamal Tampo, Mexico
Ralph Birtrum Medlin, . . . . .	Manhattan, Riley
George Clarence Mehl, . . . . .	Beloit, Mitchell
Frank Merrill, . . . . .	Le Roy, Coffey
Edna Mabel Metz, . . . . .	Jewell, Jewell
Reuben Miller, . . . . .	Milford, Geary
Edna Mitchell, . . . . .	Manhattan, Riley
Helen Mitchell, . . . . .	Manhattan, Riley
Ellis Morrill Moore, . . . . .	Manhattan, Riley
Lucile Moore, . . . . .	Manhattan, Riley
Muriel Barbara Moore, . . . . .	Manhattan, Riley
William Henry Moore, . . . . .	Tribune, Greeley
William Alfred Moriston, . . . . .	Rosedale, Wyandotte
Donald Addison Morton, . . . . .	Elk Falls, Elk
Leo Clifford Moser, . . . . .	Cortland, Republic
Ruben Reison Mouttet, . . . . .	Hillsboro, Marion
Opie Olan Mowry, . . . . .	Luray, Russell
Andrew Scott Muir, . . . . .	Stockton, Rooks
Zenith Mullen, . . . . .	Labette, Labette
Edith Lura Nash, . . . . .	Topeka, Shawnee
Comfort Amanda Neale, . . . . .	Manhattan, Riley
John Rogers Neale, . . . . .	Manhattan, Riley
Philip Earl Neale, . . . . .	Manhattan, Riley
Chester Parker Neiswender, . . . . .	Topeka, Shawnee
Harry Hibbard Nelson, . . . . .	Wakarusa, Shawnee
Oliver Franklin Nelson, . . . . .	Manhattan, Riley
Frank Nick Ney, . . . . .	Cliffin, Barton
Carrie Ada Neusbaum, . . . . .	Manhattan, Riley
Barbara Lenora Nicolay, . . . . .	Manhattan, Riley
Eunice Nicolay, . . . . .	Manhattan, Riley
Clarence Gilbert Nicholson, . . . . .	Manhattan, Riley
Henry Otis Niehaus, . . . . .	Whiting, Jackson
Mabel Alma Niehenke, . . . . .	Manhattan, Riley
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Walter Bowman Palmer, . . . . .	Manhattan, Riley
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Richard Harry Parsons, . . . . .	Arkansas City, Cowley
Gladys Isabell Patterson, . . . . .	Clifton, Washington
Leroy Dudley Patton, . . . . .	Wichita, Sedgwick
Gay Elbert Paxton, . . . . .	Emporia, Lyon
Thomas Howard Payne, . . . . .	Hutchinson, Reno
Nevels Pearson, . . . . .	Manhattan, Riley
Ada Lucile Pellet, . . . . .	Eudora, Douglas
Iva Ida Pemberton, . . . . .	Yates Center, Woodson
Minnie Fern Peppiatt, . . . . .	Ellsworth, Ellsworth
Essie Leah Peterson, . . . . .	Kansas City, Wyandotte
Oscar Francis Peterson, . . . . .	Manhattan, Riley
Lillian Marie Peterson, . . . . .	Vesper, Lincoln
Samuel David Petrie, . . . . .	Pratt, Pratt
Fred Pollom, . . . . .	Topeka, Shawnee
Olive Clara Potter, . . . . .	New Albany, Wilson
William Robert Pryor, . . . . .	Fredonia, Wilson
Joseph Lloyd Puckett, . . . . .	Partridge, Reno
Ray Marriion Purinton, . . . . .	Banner, Trego
John Harold Rasford, . . . . .	Kansas City, Wyandotte
Zeno Clifford Rechel, . . . . .	Hutchinson, Reno
James Everett Redburn, . . . . .	El Dorado, Butler
Mary Ann Redden, . . . . .	Manhattan, Riley
Marion Capps Reed, . . . . .	Havensville, Pottawatomie
Ward Irving Reed, . . . . .	Havensville, Pottawatomie
Raymond Giffillan Reeve, . . . . .	Garden City, Finney
Sarah Inez Reynolds, . . . . .	Kensington, Smith
Ralph Joseph Richards, . . . . .	Manhattan, Riley
Nellie Caldonia Richardson, . . . . .	Kansas City, Wyandotte
Edward Stanton Riley, . . . . .	Dover, Shawnee
Fulton Dick Ring, . . . . .	McPherson, McPherson
Jacob Noah Ring, . . . . .	Caldwell, Sumner
Malcolm Roach, . . . . .	Manhattan, Riley
Floyd Clifford Roadhouse, . . . . .	Portis, Osborne
Carl Otto Roda, . . . . .	Paradise, Russell
William Herman Roda, . . . . .	Paradise, Russell
Harold Edwin Roe, . . . . .	Vinland, Douglas
Joe Edward Roesler, . . . . .	Holyrood, Ellsworth
Lloyd Leland Roll, . . . . .	Wichita, Sedgwick
Nerva Viola Ross, . . . . .	Coolidge, Hamilton
Carl Rowland Rothrock, . . . . .	Baldwin, Douglas
Orvid Vance Russell, . . . . .	New Albany, Wilson
Theodore Fay Russell, . . . . .	Paola, Miami
Everett Chester Rice, . . . . .	Oxford, Sumner
Alma Ruth Schafer, . . . . .	Manhattan, Riley
Hugh Howard Scherer, . . . . .	St. John, Stafford
Dan Scheufler, . . . . .	Great Bend, Barton
Elias Elizabeth Scheufler, . . . . .	Great Bend, Barton
Merrill Philip Schlaegel, . . . . .	Vermilion, Marshall
Anna Schlegel, . . . . .	Abilene, Dickinson
Clara Schober, . . . . .	Baker, Brown
Frank Schwartz, . . . . .	Manhattan, Riley
Chester McKinley Scott, . . . . .	Manhattan, Riley
Ruby Pearl Scott, . . . . .	Manhattan, Riley
Clarence Roy Sheets, . . . . .	Topeka, Shawnee
Robert Shimmin, . . . . .	Manhattan, Riley
David Loyd Signor, . . . . .	Manhattan, Riley
Clarence Simcox, . . . . .	Canton, McPherson
Clarence Harvey Simon, . . . . .	Haddam, Washington
Nora Marguerite Simonson, . . . . .	Manhattan, Riley
Edna Skinner, . . . . .	Manhattan, Riley
Francis Slattery, . . . . .	Jewell, Jewell
Allen Thurman Smith, . . . . .	La Cygne, Linn
Henry Edwin Smith, . . . . .	Manhattan, Riley
Mollie Manerva Smith, . . . . .	Westphalia, Anderson
Paul Walter Smith, . . . . .	Osborne, Osborne
Ray Leonel Smith, . . . . .	Washington, Washington
Frances Colista Snyder, . . . . .	Lawrence, Douglas
Ray Sook, . . . . .	Topeka, Shawnee
George Sorick, . . . . .	Narka, Republic
George William Sova, . . . . .	Harper, Harper
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SPECIAL, SCHOOL OF AGRICULTURE—*continued.*

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Rose Elizabeth Straka, . . . . .	McPherson, McPherson
John Godfrey Stutz, . . . . .	Utica, Ness
Hartwell Wheeler Sullivan, . . . . .	Bazaar, Chase
Francis Edgar Sweet, . . . . .	Manhattan, Riley
Cleda Geneva Taylor, . . . . .	Manhattan, Riley
Earl Hicks Teagarden, . . . . .	Wayne, Republic
Roy Otto Temple, . . . . .	Larned, Pawnee
Orin Milton Thatcher, . . . . .	Manhattan, Riley
Harold Theiss, . . . . .	Hutchinson, Reno
Anna Elizabeth Thomas, . . . . .	Kansas City, <i>Missouri</i>
Kyle David Thompson, . . . . .	Densmore, Norton
Frank Sylvester Toms, . . . . .	Wichita, Sedgwick
Harland Beal Towne, . . . . .	Valencia, Shawnee
Calvin Stover Tressler, . . . . .	Peabody, Marion
Richard Culbert Tunstall, . . . . .	Manhattan, Riley
Zelma Mabel Turner, . . . . .	Seneca, Nemaha
Gail Maurice Umberger, . . . . .	Elmdale, Chase
Alexander Unruh, . . . . .	Pawnee Rock, Barton
Frank VanHaltern, . . . . .	Manhattan, Riley
Archie Dennis VanPetten, . . . . .	Washington, Washington
Loren Gilbert VanZile, . . . . .	Manhattan, Riley
Adelpha Ruth Vilander, . . . . .	Manhattan, Riley
Joseph Kelly Walker, . . . . .	Ellsworth, Ellsworth
Alice Webster, . . . . .	Manhattan, Riley
Ethel Winona Wehrman, . . . . .	Nelson, <i>Nebraska</i>
William Andrew Wehry, . . . . .	Peabody, Marion
William Henry Weir, . . . . .	Topeka, Shawnee
Peter Weissbeck, . . . . .	Collyer, Trego
Thomas Welch, . . . . .	Emporia, Lyon
Adelaide Wemmer, . . . . .	Princeton, Franklin
George Louis Whitecomb, . . . . .	Cedar Point, Chase
Mrs. Etoila Myrtle White, . . . . .	Manhattan, Riley
Julia May White, . . . . .	Manhattan, Riley
William Moorhead White, . . . . .	Natoma, Osborne
Wilma Whitmore, . . . . .	Manhattan, Riley
Gilbert Whitsitt, . . . . .	Manhattan, Riley
Arthur Wayne Wilhite, . . . . .	Rosedale, Wyandotte
Clyda Dell Wilkinson, . . . . .	Manhattan, Riley
Aline Letitia Williams, . . . . .	Sylvan Grove, Lincoln
Bowman Minor Williams, . . . . .	Albuquerque, <i>New Mexico</i> .
Embre Lloyd Williams, . . . . .	Bigelow, Marshall
Lee Scott Williams, . . . . .	Sylvan Grove, Lincoln
Owen Williamson, . . . . .	Manhattan, Riley
Homer Bryan Willis, . . . . .	Manhattan, Riley
Kay Wilson, . . . . .	Clifton, Washington
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Perry Wilson, . . . . .	Englewood, Clark
Alice Pearl Wismer, . . . . .	Pomona, Franklin
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Alice Jean Wood, . . . . .	Anthony, Harper
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Ralph Woods, . . . . .	Newton, Harvey
Ava Hazelletine Woodworth, . . . . .	Tecumseh, Shawnee
Helen Elizabeth Work, . . . . .	St. Joseph, <i>Missouri</i>
Bertha Effie Wreath, . . . . .	Manhattan, Riley
Nellie Flo Yantis, . . . . .	Garrison, Pottawatomie
Samuel Floyd Yocum, . . . . .	St. John, Stafford
Alvin Bernard Zerbe, . . . . .	Andover, Butler

## SPECIAL STUDENTS

George William Ackley, . . . . .	Portis, Osborne
Harry Edwin Alexander, . . . . .	Council Grove, Morris
(Mrs.) Walter Allee, . . . . .	Manhattan, Riley
Florence Willetta Baird, . . . . .	Cherryvale, Montgomery
Paul Kitchell Baker, . . . . .	Cherryvale, Montgomery
Beverly Bealmear, . . . . .	Dodge City, Ford
Forrest Fleet Booker, . . . . .	Beloit, Mitchell
James Irwin Brady, . . . . .	Manhattan, Riley
Marion Percival Broughten, . . . . .	Marysville, Marshall
Elmer Louis Brown, . . . . .	Great Bend, Barton
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Katharine Maxwell Bower, . . . . .	Parsons, Labette

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John Burkdoll, . . . . .	Ottawa, Franklin
Alfred Byarlay, . . . . .	Bala, Riley
Alfred Harry Cellar, . . . . .	Agricola, Coffey
Sarah Elizabeth Cassel, . . . . .	Manhattan, Riley
John Root Church, . . . . .	New York, New York
Klye Coffman, . . . . .	Topeka, Shawnee
Oren Clarence Cook, . . . . .	Medicine Lodge, Barber
Clyde Corbet, . . . . .	Valencia, Shawnee
Verne Abner Craven, . . . . .	Erie, Neosho
William Cunningham, . . . . .	Summerfield, Marshall
Robert Grant Cushman, . . . . .	Emporia, Lyon
Leroy Dill, . . . . .	Manhattan, Riley
Marguerite Dodd, . . . . .	Manhattan, Riley
Juan Duran, . . . . .	Crawford, Rice
Ebenezer Torrey Englesby, . . . . .	Manhattan, Riley
George Errebo, . . . . .	Vesper, Lincoln
Florence Evans, . . . . .	Gosheen, Indiana
Mary Farwell, . . . . .	Fredonia, Wilson
Ethel Feese, . . . . .	Pratt, Pratt
Oliver Archie Findley, . . . . .	Manhattan, Riley
Frances Fontaine, . . . . .	Manhattan, Riley
Archibald Alexander Glenn, . . . . .	Manhattan, Riley
Ivy Pearl Green, . . . . .	Manhattan, Riley
Caroline Greene, . . . . .	Manhattan, Riley
Ida Helen Greene, . . . . .	Manhattan, Riley
Frank Carl Gutsche, . . . . .	Manhattan, Riley
Gertrude Belle Harris, . . . . .	Cottonwood Falls, Chase
Vida Hawkins, . . . . .	Marysville, Marshall
Grace Hays, . . . . .	Great Bend, Barton
William Hearst, . . . . .	Parsons, Labette
Arthur James Hoffman, . . . . .	Manhattan, Riley
Clarence Hole, . . . . .	Manhattan, Riley
Charles William Honick, . . . . .	Morrill, Brown
Jessie Hubbell, . . . . .	Lebanon, Smith
Josephine Hubbell, . . . . .	Lebanon, Smith
Fannie Queen Humfeld, . . . . .	Manhattan, Riley
John Caleb Huston, . . . . .	Ogden, Riley
George Thomas Ingalls, . . . . .	Elmore County, Idaho
Marguerite Hartwell Johnson, . . . . .	Garden City, Finney
William Jones, . . . . .	Reading, Lyon
Emil Oliver Jorgenson, . . . . .	Manhattan, Riley
Merritt Lincoln Keithline, . . . . .	Shannon, Atchison
Robert Kirshner, . . . . .	Kansas City, Missouri
William Albert Lathrop, . . . . .	Manhattan, Riley
Frank Baxter Lawton, . . . . .	Newton, Harvey
Henrietta Lheureux, . . . . .	Concordia, Cloud
Frederick Herbert Loomis, . . . . .	Alton, Osborne
Joseph Lundén, . . . . .	Salina, Saline
Festus Claude McKay, . . . . .	Clarendon, Jamaica
Newton Allen McCosh, . . . . .	Longford, Clay
Benjamin McManis, . . . . .	Manhattan, Riley
Harold Oscar Marsh, . . . . .	Manhattan, Riley
Ernest DeLana Miller, . . . . .	Manhattan, Riley
James Morgan, . . . . .	Manhattan, Riley
Fred Mossman, . . . . .	Manhattan, Riley
Florence Mulvey, . . . . .	Wichita, Sedgwick
George Meredith Newlin, . . . . .	Hutchinson, Reno
Harold Newton, . . . . .	Manhattan, Riley
Lucile Owens Norwood, . . . . .	Manhattan, Riley
James O'Connell, . . . . .	Kiowa, Barber
Edward Nelson Orear, . . . . .	Kansas City, Missouri
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Annette Woodward Perry, . . . . .	Manhattan, Riley
Charles Beryl Pitman, . . . . .	Manhattan, Riley
Leslie Averill Plumb, . . . . .	Pleasanton, Linn
Glen Frank Pollom, . . . . .	Topeka, Shawnee
Frank Ranney, . . . . .	Osawatimie, Miami
Arthur Schopmeyer, . . . . .	Manhattan, Riley
Edward Adolf Schmoker, . . . . .	Bern, Switzerland
Verna Jane Schumacher, . . . . .	Marysville, Marshall
Minnie Elizabeth Scott, . . . . .	Westmoreland, Pottawatomie
August Shattenberg, . . . . .	Manhattan, Riley
Edvin Sheets, . . . . .	Topeka, Shawnee
Warren Sheff, . . . . .	Haven, Reno
Leslie Sipple, . . . . .	Kirksville, Missouri
Alberta Smith, . . . . .	Manhattan, Riley
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## List of Students

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Sanford Willis Summers, . . . . .	Iola, Allen
Raymond Garfield Taylor, . . . . .	Manhattan, Riley
DeWitt Corwin Thomas, . . . . .	Wamego, Pottawatomie
Raleigh Glenn Toothaker, . . . . .	Manhattan, Riley
Jennie Marie Turner, . . . . .	Newton, Harvey
Frank Edwin Uhl, . . . . .	Manhattan, Riley
Lola May Umbaugh, . . . . .	Springdale, <i>Arkansas</i>
(Mrs.) Grace Utt, . . . . .	Manhattan, Riley
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Lyman Rae Vawter, . . . . .	Manhattan, Riley
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Ora Bella Whiteside, . . . . .	Kansas City, Wyandotte
Lillian Maude Wickerham, . . . . .	Belle Center, <i>Ohio</i>
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Jennie Wilkinson, . . . . .	Manhattan, Riley
William James Yeoman, . . . . .	Hutchinson, Reno

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John William Allen, . . . . .	Norwich, Kingman
Jane Webb Allsup, . . . . .	Waelder, <i>Texas</i>
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Austin Ohandler Andrews, . . . . .	Hiawatha, Brown
Alfred Carroll Apitz, . . . . .	Manhattan, Riley
Ruth Arbuthnot, . . . . .	Belleville, Republic
Tressa Alda Archer, . . . . .	Salina, Saline
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Lillian Bell Baker, . . . . .	Manhattan, Riley
Mary Maria Baird, . . . . .	Cherryvale, Montgomery
Ethel Loleta Bales, . . . . .	Manhattan, Riley
Georgia Wildey Baird, . . . . .	Highland, Doniphan
Madeleine Baird, . . . . .	Manhattan, Riley
Ethel May Balmer, . . . . .	Hiawatha, Brown
Nancy Mary Barhite, . . . . .	Manhattan, Riley
John Otto Barnes, . . . . .	Manhattan, Riley
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Albert William Bellomy, . . . . .	Manhattan, Riley
Mary Bernard, . . . . .	Concordia, Cloud
Carlos Tomas Bischoff, . . . . .	Manhattan, Riley
Ruth Leota Blevens, . . . . .	Arkansas City, Cowley
Belle Bowen, . . . . .	Arnold, Ness
Myron Ralph Bowerman, . . . . .	Manhattan, Riley
William Dennis Brigham, . . . . .	Burlington, Coffey
Ruth Bright, . . . . .	Manhattan, Riley
Jessie Mabel Brown, . . . . .	Ellsworth, Ellsworth
Lora Kathryn Brown, . . . . .	Dwight, Morris
Margaret Isla Bruce, . . . . .	Marquette, McPherson
William Cullen Bryant, . . . . .	Cimarron, Gray
Edmund Woodbridge Buffon, . . . . .	Powhattan, Brown
Vernon Everett Bundy, . . . . .	Randolph, Riley
Dorothy Jo Buschow, . . . . .	Colby, Thomas
Cora Gertrude Campbell, . . . . .	Junction City, Geary
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Evelyn Dulcina Carey, . . . . .	Manhattan, Riley
Helen Juanita Carey, . . . . .	Manhattan, Riley
Lucile Margaret Carey, . . . . .	Manhattan, Riley
Minnie Christina Carls, . . . . .	Wakarusa, Shawnee
Effie May Carp, . . . . .	Wichita, Sedgwick
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Alfred Lester Clapp, . . . . .	Yates Center, Woodson
Kathryn Agnes Clark, . . . . .	Junction City, Geary
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SUMMER SCHOOL STUDENTS—*continued.*

<i>Names</i>	<i>Post office (county or state)</i>
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Hattie Cleavinger, . . . . .	Lowemont, Leavenworth
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Edna Florence Coith, . . . . .	Manhattan, Riley
Harry Lewis Cole, . . . . .	Manhattan, Riley
Mary Elizabeth Collett, . . . . .	Atchison, Atchison
Aubrey Deakens Conrow, . . . . .	Manhattan, Riley
Fanny Cordell, . . . . .	Horton, Brown
Margaret Louise Cowden, . . . . .	Monmouth, Illinois
Lily Martha Craton, . . . . .	Romana, Marion
Grace Lucile Craven, . . . . .	Erie, Neosho
Verral Janice Cravens, . . . . .	Erie, Neosho
Katharyn Woodrow Curless, . . . . .	Pittsburg, Crawford
Esther Curtis, . . . . .	Manhattan, Riley
Kathryne May Danenbarger, . . . . .	Bellaire, Smith
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Aubrey Elbert Davidson, . . . . .	Webber, Jewell
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Earl Edward Davis, . . . . .	Manhattan, Riley
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Margaret Elizabeth Davis, . . . . .	Lyons, Rice
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Fay Farber, . . . . .	Hoxie, Sheridan
Bessie Fern Farber, . . . . .	Hoxie, Sheridan
George Frank Filley, . . . . .	Irving, Marshall
Fred Ira Fix, . . . . .	Manhattan, Riley
Dora Foraker, . . . . .	Wellington, Sumner
Ruth Lucile Foster, . . . . .	Hiawatha, Brown
Lena Fossler, . . . . .	Norcat, Decatur
Karl Fromm, . . . . .	Elmo, Dickinson
Hulda Olivia Froom, . . . . .	Vermilion, Marshall
Clarence Griffing Fry, . . . . .	Manhattan, Riley
Velora Augusta Fry, . . . . .	Manhattan, Riley
Grace Ethel Garvie, . . . . .	Abilene, Dickinson
Will Cuthwaite Gibbon, . . . . .	Howard, Elk
Grace Gilkinson, . . . . .	Kanopolis, Ellsworth
Josephyne Lura Gilmore, . . . . .	Manhattan, Riley
Mabel Lucile Glenn, . . . . .	Minneapolis, Ottawa
Ethel Goheen, . . . . .	Manhattan, Riley
Ruth Goheen, . . . . .	Clay Center, Clay
Marie Antoinette Goodman, . . . . .	Dwight, Morris
Alphonso Gorrell, . . . . .	California, Missouri
Maynard Goudy, . . . . .	Waverly, Coffey
Ivy Pearl Green, . . . . .	Manhattan, Riley
Mary Elizabeth Green, . . . . .	Glen Elder, Mitchell
Caroline Emma Greene, . . . . .	Manhattan, Riley
Ida Helen Greene, . . . . .	Manhattan, Riley
Lucy Hermina Griem, . . . . .	Zenda, Kingman
Mattie Dorothy Griem, . . . . .	Zenda, Kingman
Sophia Margaret Griem, . . . . .	Zenda, Kingman
Leroy Griffie, . . . . .	Jewell City, Jewell
Josie Margaret Griffith, . . . . .	Manhattan, Riley
Edythe Seavert Groome, . . . . .	Manhattan, Riley
Adeline Poston Groves, . . . . .	Edwardsville, Wyandotte
Francis James Guffee, . . . . .	Irving, Marshall
Minnie Agnes Gugenhan, . . . . .	May Day, Riley
Mary Gurnea, . . . . .	Belleville, Republic
Esther Gygas, . . . . .	Osborne, Osborne
Alma Grace Halbower, . . . . .	Anthony, Harper
Effie Hand, . . . . .	Clay Center, Clay
Alta Marie Handlin, . . . . .	Manhattan, Riley
Ethel Elizabeth Hannah, . . . . .	Topeka, Shawnee
Ellen Julia Hanson, . . . . .	Marquette, McPherson

## SUMMER SCHOOL STUDENTS—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Faith Hathaway Harling, . . . . .	Manhattan, Riley
Earl Raymond Harrouff, . . . . .	Inman, McPherson
Fred Hartwig, . . . . .	Goodland, Sherman
Lela Vere Haworth, . . . . .	Scott City, Scott
George Chester Hitchcock, . . . . .	Tescott, Ottawa
John Russell Hewitt, . . . . .	Attica, Harper
Mae Virgia Hildebrand, . . . . .	Montezuma, Gray
Mabel Claire Hobart, . . . . .	Paola, Miami
San Ling Hoo, . . . . .	Harkow, China
Mary Hoover, . . . . .	Canton, McPherson
George Arthur Hopp, . . . . .	Manhattan, Riley
Esther Grace Hole, . . . . .	Manhattan, Riley
Lura Beatrix Houghton, . . . . .	Manhattan, Riley
Nora Melissa Hott, . . . . .	Hiawatha, Brown
Ethel Margaret Hotte, . . . . .	Manhattan, Riley
Leland Howell, . . . . .	Topeka, Shawnee
Josiah Simson Hughes, . . . . .	Manhattan, Riley
Rees Hughes, . . . . .	Fort Scott, Bourbon
Ruth Hughes, . . . . .	Topeka, Shawnee
Arthur Sinclair Hull, . . . . .	Nickerson, Reno
Nellie Elizabeth Hunt, . . . . .	Manhattan, Riley
Forrest Huntington, . . . . .	Rosedale, Wyandotte
Ruth Adesta Huntington, . . . . .	Rosedale, Wyandotte
Ruth Amelia Hutchings, . . . . .	Manhattan, Riley
Louis Edgar Hutto, . . . . .	Manhattan, Riley
Aldie Philip Immenschuh, . . . . .	Manhattan, Riley
Louise Jacobs, . . . . .	Council Grove, Morris
Judith Elizabeth Jacobson, . . . . .	Waterville, Marshall
Jeanetta James, . . . . .	Manhattan, Riley
Mattie Bergette Jensen, . . . . .	Junction City, Geary
James Walter Johansen, . . . . .	Hays, Ellis
Leroy Cephas Johnson, . . . . .	Savonburg, Allen
Harry Vincent Jones, . . . . .	Louisburg, Miami
Donald Jordan, . . . . .	Topeka, Shawnee
Margaret Justin, . . . . .	Manhattan, Riley
Ethel Kellogg, . . . . .	Wellington, Sumner
Hattie Lea Kennel, . . . . .	Herrington, Dickinson
Harry Liewellyn Kent, . . . . .	Manhattan, Riley
Ellis Wesley Kern, . . . . .	Kirwin, Phillips
Jessie Wright Keyes, . . . . .	Manhattan, Riley
Mrs. Will King, . . . . .	Iola, Allen
Archer Franklin Kiser, . . . . .	Manhattan, Riley
Alice Irene Kiser, . . . . .	Manhattan, Riley
Evelyn Nellie Kizer, . . . . .	Manhattan, Riley
Vera Belle Kizer, . . . . .	Manhattan, Riley
Lena Klamm, . . . . .	Basehor, Leavenworth
George Washington Kolterman, . . . . .	Manhattan, Riley
Fred Albert Korsmeier, . . . . .	Manhattan, Riley
Helena Kramer, . . . . .	Junction City, Geary
Mary Stephen Lane, . . . . .	Eskridge, Wabaunsee
Vivian Belle Lankard, . . . . .	Rosedale, Wyandotte
John Albert Larson, . . . . .	Chanute, Neosho
Lillian Antoinette Lathrop, . . . . .	Manhattan, Riley
Golda Vinona Lawrence, . . . . .	Mankato, Jewell
Drusie Myrtle League, . . . . .	Home, Marshall
Claire Lewallen, . . . . .	Manhattan, Riley
Nyle Eloise Lewallen, . . . . .	Manhattan, Riley
Mary Mildred Lewis, . . . . .	Paola, Miami
John Lindenwood, . . . . .	Stilwell, Johnson
Catherine Linhart, . . . . .	Irving, Marshall
Milton Hicks Lapum, . . . . .	Manhattan, Riley
Foo Yuen Lim, . . . . .	Canton, China
George Matthew Lortz, . . . . .	Parsons, Labette
Blanche Daisy Losh, . . . . .	Leon, Butler
Lillie Edna Lundberg, . . . . .	Manhattan, Riley
John Lyons, . . . . .	Manhattan, Riley
Isabel Pauline McAdam, . . . . .	Arkansas City, Cowley
James Marshall McArthur, . . . . .	Walton, Harvey
Helen Pearl McClanahan, . . . . .	Homestead, Florida
Mary Emma McCluskey, . . . . .	Junction City, Geary
Maude Nonamaker McCulloch, . . . . .	Manhattan, Riley
Grace Kerns McCoppin, . . . . .	Phillipsburg, Phillips
Irene Margaret McElroy, . . . . .	Manhattan, Riley
Jessie Katharine McGuire, . . . . .	Hutchinson, Reno
Festus Claudius McKay, . . . . .	Crooked River, Jamaica
Preston Essex McNall, . . . . .	Gaylord, Smith
Mary Elizabeth McNamara, . . . . .	Manhattan, Riley

## SUMMER SCHOOL STUDENTS—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Isabella Mack, . . . . .	Manhattan, Riley
Anna Josefina Carolina Malm, . . . . .	Manhattan, Riley
George William Marquardt, . . . . .	Enterprise, Dickinson
Maude Marshall, . . . . .	Manhattan, Riley
Sarah Marty, . . . . .	Manhattan, Riley
Golda Masters, . . . . .	Manhattan, Riley
Elise Sity Masterson, . . . . .	Manhattan, Riley
Harry Virgil Matthew, . . . . .	Manhattan, Riley
Elizabeth Esther Merilatt, . . . . .	Ramona, Marion
Belle Miller, . . . . .	Sabetha, Nemaha
Katherine Miller, . . . . .	Abbyville, Reno
Robert Francis Mirick, . . . . .	Otis, Rush
Minnie Martha Mischke, . . . . .	Long Island, Phillips
Josephine Mitchell, . . . . .	Manhattan, Riley
Elizabeth Lovinia Morwick, . . . . .	Eskridge, Wabaunsee
Mary Ada Moore, . . . . .	Junction City, Geary
Ava Morris, . . . . .	Ottawa, Franklin
Clara Morris, . . . . .	Ottawa, Franklin
Flora Alma Morris, . . . . .	Ottawa, Franklin
Margaret Ethel Moseley, . . . . .	Alma, Wabaunsee
Ralph Landis Mosier, . . . . .	Muskogee, Oklahoma
Zenith Mullen, . . . . .	Labette, Labette
Florence Katherine Mulvey, . . . . .	Wichita, Sedgwick
Ralph Hershey Musser, . . . . .	Abilene, Dickinson
Telle Edward Nafziger, . . . . .	Manhattan, Riley
Esther Lerida Nelson, . . . . .	Manhattan, Riley
Winifred Louise Neusbaum, . . . . .	Manhattan, Riley
Grace Lee Newman, . . . . .	Rosedale, Wyandotte
Myra Myrtle Nicholson, . . . . .	Manhattan, Riley
Mabel Nixon, . . . . .	Manhattan, Riley
Mary Visitation Nolan, . . . . .	Concordia, Cloud
Ida Mae Northrop, . . . . .	Manhattan, Riley
Nellie May Olson, . . . . .	Harveyville, Wabaunsee
Guy Clifton Omer, . . . . .	Mankato, Jewell
Rose Amelia O'Neill, . . . . .	Beattie, Marshall
Walter John Ott, . . . . .	Greenleaf, Washington
Dora Marie Otto, . . . . .	Riley, Riley
Susan Rufina Paddock, . . . . .	Blue Mound, Linn
Henry James Plumb, . . . . .	La Cygne, Linn
Maude Ellen Pantan, . . . . .	Austin, Texas
Mabel Parker, . . . . .	Osborne, Osborne
Andrew Paterson, . . . . .	Manhattan, Riley
Helen Payne, . . . . .	Parsons, Labette
Eva Mae Pease, . . . . .	Manhattan, Riley
Joseph Price Perrill, . . . . .	Manhattan, Riley
Mary Frances Perry, . . . . .	Manhattan, Riley
Samuel Ulysses Pett, . . . . .	Emporia, Lyon
Phoebe Elva Phillips, . . . . .	Manhattan, Riley
Marie Pickrell, . . . . .	Leon, Butler
Samuel Victor Pihl, . . . . .	Lindsborg, McPherson
Thurza Elizabeth Pitman, . . . . .	Manhattan, Riley
Zelma Roena Platt, . . . . .	Mankato, Jewell
Lillie May Ponton, . . . . .	Austin, Texas
Iva Holt Porter, . . . . .	Glen Elder, Mitchell
Ethelyn Pearl Pray, . . . . .	Manhattan, Riley
Maggie Price, . . . . .	Manhattan, Riley
Ina Frank Priest, . . . . .	Manhattan, Riley
George Pulliam, . . . . .	Nickerson, Reno
Grovenor Ward Putnam, . . . . .	Larned, Pawnee
Harvey Cincinnatus Ray, . . . . .	Larned, Pawnee
Zeno Clifford Rechel, . . . . .	Hutchinson, Reno
Fred Thomas Rees, . . . . .	Grantville, Jefferson
Raymond Gilfillan Reeve, . . . . .	Garden City, Finney
Ted Welden Reynolds, . . . . .	Ottawa, Franklin
George Willis Rhine, . . . . .	Manhattan, Riley
Esther Katharine Richards, . . . . .	Manhattan, Riley
Hazle Irene Richardson, . . . . .	Dunavant, Jefferson
Ola Maphis Ridings, . . . . .	Salina, Saline
Edna May Roberts, . . . . .	Scandia, Republic
Floyd Joe Robbins, . . . . .	Manhattan, Riley
Pearl Elzora Maxine Rorabaugh, . . . . .	Lebanon, Smith
Lila May Rose, . . . . .	Manhattan, Riley
Mary Susan Rowan, . . . . .	Arkansas City, Cowley
Marie A. J. Rudnick, . . . . .	Chicago, Illinois
Clara Louise Sachau, . . . . .	Manhattan, Riley
Mary Alberta Savoy, . . . . .	Concordia, Cloud
Albert Leslie Schell, . . . . .	Wichita, Sedgwick
Bertha Ruegg Schwab, . . . . .	Clifton, Washington



## SUMMER SCHOOL STUDENTS—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Bertha Anna Senft, . . . . .	Topeka, Shawnee
Edward Loy You Shim, . . . . .	Kahului, <i>Hawaii</i>
Everett Gladstone Shimmin, . . . . .	Manhattan, Riley
Mary Mae Shingledecker, . . . . .	New Mayville, <i>Pennsylvania</i>
Elgie Mae Shuler, . . . . .	Wichita, Sedgwick
Faye Ellen Simmon, . . . . .	Wichita, Sedgwick
Margaret Simpson, . . . . .	Council Grove, Morris
Alma Louise Skinner, . . . . .	Manhattan, Riley
Florence Hazel Smith, . . . . .	Manhattan, Riley
Ned Smith, . . . . .	Manhattan, Riley
Orliff Elmer Smith, . . . . .	Manhattan, Riley
Vesta Smith, . . . . .	Parsons, Labette
Mary Amanda Spaniol, . . . . .	Manhattan, Riley
Fannye Myrtle Spaniol, . . . . .	Manhattan, Riley
Whitcomb Glenn Speer, . . . . .	Cottonwood Falls, Chase
Earl Springer, . . . . .	Highland, Doniphan
Pluma Stavely, . . . . .	Lyndon, Osage
Anna Steckelberg, . . . . .	Plymouth, <i>Nebraska</i>
Christian Daniel Steiner, . . . . .	Manhattan, Riley
Lola Dow Stoddard, . . . . .	Manhattan, Riley
Mary Dow Stoddard, . . . . .	Manhattan, Riley
Marcia Story, . . . . .	Manhattan, Riley
Clarina May Sumners, . . . . .	Manhattan, Riley
Lauretta Victoria Sumners, . . . . .	Manhattan, Riley
Carl Leonard Swenson, . . . . .	Little River, Rice
May Leigh Symonds, . . . . .	Peabody, Marion
Blanche Lovina Tanner, . . . . .	Manhattan, Riley
Gail Tatman, . . . . .	Manhattan, Riley
Emma Elizabeth Taylor, . . . . .	Wichita, Sedgwick
Robert John Taylor, . . . . .	Manhattan, Riley
Bertha Teagarden, . . . . .	Wayne, Republic
Alice Edna Terrill, . . . . .	Lawrence, Douglas
Cora Tempero, . . . . .	Clay Center, Clay
Ethel Inez Theis, . . . . .	Wichita, Sedgwick
Carrie Edith Thompson, . . . . .	Cimarron, Gray
Irene Thompson, . . . . .	Topeka, Shawnee
Wells Thornton, . . . . .	Russell, Russell
Erwin Milton Tiffany, . . . . .	Lyndon, Osage
Eva Esther Townsend, . . . . .	Nickerson, Reno
Bertha Truesdell, . . . . .	Lyons, Rice
Bernice Truesdell, . . . . .	Lyons, Rice
Mary Adaline Tunstall, . . . . .	Manhattan, Riley
Edna Ullom, . . . . .	Paola, Miami
Edgar Allen Vaughn, . . . . .	Toronto, Woodson
Philip Cornelius Vilander, . . . . .	Manhattan, Riley
Ida Helder Voiles, . . . . .	Manhattan, Riley
Margaret Esther Walbridge, . . . . .	Russell, Russell
Arthur Walker, . . . . .	Manhattan, Riley
Irene Eleanor Walker, . . . . .	Manhattan, Riley
Bess Blanche Walsh, . . . . .	Clay Center, Clay
Edith Mary Walsh, . . . . .	Manhattan, Riley
Frances Josephine Walsh, . . . . .	Clay Center, Clay
Edward Anthony Ward, . . . . .	Langston, <i>Oklahoma</i>
Tillie Warder, . . . . .	Abilene, Dickinson
Charlotte Pearl Wartenbee, . . . . .	Liberal, Seward
Nellie Merle Wartenbee, . . . . .	Liberal, Seward
Hazel Emma Weber, . . . . .	Manhattan, Riley
Julia Veronica Wendel, . . . . .	Beattie, Marshall
Laura Westphal, . . . . .	Manhattan, Riley
Hannah Amelia Wetzig, . . . . .	Manhattan, Riley
Amelia Ursula Wheeler, . . . . .	Manhattan, Riley
Julia May White, . . . . .	Manhattan, Riley
Raymond Hazzleton Whitenack, . . . . .	Concordia, Cloud
Flora Emily Theresa Wiest, . . . . .	Manhattan, Riley
Gladys Wilcox, . . . . .	Manhattan, Riley
Dovie Mae Williams, . . . . .	Kansas City, Wyandotte
Marshall Parrish Wilder, . . . . .	Manhattan, Riley
Louis Coleman Williams, . . . . .	Manhattan, Riley
Nina Marie Williams, . . . . .	Winfield, Cowley
Chloe Willis, . . . . .	Manhattan, Riley
Andra Marie Wilson, . . . . .	Duquoin, Harper
Harry Homer Wilson, . . . . .	Silver Lake, Shawnee
Walter Earle Wilson, . . . . .	Duquoin, Harper
Wilma Elsie Whitmore, . . . . .	Manhattan, Riley
Albert Mun Yim, . . . . .	Honolulu, <i>Hawaii</i>
Charles Hall Withington, . . . . .	Allen, Lyon
George Edna Withington, . . . . .	Allen, Lyon

## SUMMER SCHOOL STUDENTS—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Jesse Wittmeyer, . . . . .	Manhattan, Riley
Cora Edna Woods, . . . . .	Ottawa, Franklin
Willits Reeve Worthington, . . . . .	Manhattan, Riley
James Howard Young, . . . . .	Kansas City, Wyandotte
Mary Beatrice Zarker, . . . . .	Topeka, Shawnee
Ruth Ziegler, . . . . .	Salina, Saline
Blanche Anna Zurcher, . . . . .	Newton, Harvey

## HOUSEKEEPERS' COURSE

Anna D Adams, . . . . .	Everest, Brown
Myrtle Margaret Alexander, . . . . .	Council Grove, Morris
Bertha Anderson, . . . . .	Independence, <i>Missouri</i>
Helena Marie Anderson, . . . . .	Garden City, Finney
Ruth Caroline Anderson, . . . . .	Lawrence, Douglas
Alma Elvira Anstrom, . . . . .	Osage City, Osage
Clara DeCena Appelroth, . . . . .	Olsburg, Pottawatomie
Edna Sophia Aspegren, . . . . .	Republic, Republic
Welcome Ayer, . . . . .	Topeka, Shawnee
Katie Baergen, . . . . .	Inman, McPherson
Delora Johnson Balrd, . . . . .	Highland, Doniphan
Dottie Bane, . . . . .	Athol, Smith
Cora Honour Blasdel, . . . . .	Attica, Harper
Ruth Hazel Buckles, . . . . .	Otego, Jewell
Martha Marie Burnside, . . . . .	Junction City, Geary
Lena Nina Butterfield, . . . . .	Overbrook, Osage
Emma Adina Carlson, . . . . .	Randolph, Riley
Cora Delmerise Chartier, . . . . .	Ames, Cloud
Hattie Cleavinger, . . . . .	Lowemont, Leavenworth
Ida Bainbridge Cluff, . . . . .	Manhattan, Riley
Olive Gwen Collins, . . . . .	Wellington, Sumner
Tillie Cordts, . . . . .	Manhattan, Riley
(Mrs.) Elsie Cowdery, . . . . .	Neodesha, Wilson
Mary Craig, . . . . .	Winchester, Jefferson
Nellie Cunningham, . . . . .	Summerfield, Marshall
Hazel Genevieve DeVoss, . . . . .	Grant, <i>Iowa</i>
Jessie Dorothea Day, . . . . .	Zeandale, Riley
Ada Dodge, . . . . .	Manhattan, Riley
Bessie Maude Dole, . . . . .	Salina, Saline
Anna Bertha Dyck, . . . . .	Halstead, Harvey
Carrie Amelia Eickmann, . . . . .	Munden, Republic
Edna Ida Eickmann, . . . . .	Munden, Republic
Edith Gertrude Evans, . . . . .	Manhattan, Riley
Hazel Marie Fawl, . . . . .	Silver Lake, Shawnee
Anna Catherine Finnigan, . . . . .	Beloit, Mitchell
Daisy Edith Flesher, . . . . .	Dover, Shawnee
Evangeline Evelyn Fortin, . . . . .	Clyde, Cloud
Ruth Cornelia Fowler, . . . . .	Brookville, Saline
Mildred Gaines, . . . . .	Adair, <i>Iowa</i>
Myrtle Florence Garrett, . . . . .	McLouth, Jefferson
Birdye May Gear, . . . . .	Buffalo, Wilson
Elizabeth Gerbrand, . . . . .	Buthler, Reno
Minna Martha Germann, . . . . .	Alta Vista, Wabaunsee
Louise Laura Gfeller, . . . . .	Junction City, Geary
Merle Francis Gifford, . . . . .	El Dorado, Butler
Claire Ginter, . . . . .	Lyons, Rice
Alice Lille Goranson, . . . . .	Randolph, Riley
Mabel Juton Goranson, . . . . .	Randolph, Riley
Lena Charlotte Golton, . . . . .	Milton, Sumner
(Mrs.) Edward Grant, . . . . .	Manhattan, Riley
Vera Lula Griffith, . . . . .	Coldwater, Comanche
Maudeline Anna Guizlo, . . . . .	Coldwater, Comanche
Mae Guttridge, . . . . .	Cullison, Pratt
Emma Inez Hagree, . . . . .	Kanona, Decatur
Effie Hollis Hale, . . . . .	Manhattan, Riley
Julia Henrietta Hammel, . . . . .	Manhattan, Riley
Edna Luethella Hancock, . . . . .	Hardy, <i>Nebraska</i>
Myrtle May Harris, . . . . .	Havensville, Pottawatomie
Elsie Mabel Hartman, . . . . .	Scottsville, Mitchell
Mary Cecile Hatton, . . . . .	Mount Hope, Sedgwick
Cora Esther Hess, . . . . .	Cedar Vale, Chautauqua
Mary Henrietta Hobart, . . . . .	Paola, Miami
Mabel Hoover, . . . . .	Manhattan, Riley
Meda Flora Howell, . . . . .	North Topeka, Shawnee
Sarah Mathilda Hubenett, . . . . .	Little River, Rice
Martha Jane Hyde, . . . . .	Wichita, Sedgwick
Helena Jantzen, . . . . .	Hillsboro, Marion

## HOUSEKEEPERS' COURSE—continued.

<i>Names</i>	<i>Post office (county or state)</i>
Josephine Johnson, . . . . .	Sterling, Rice
Nora Elva Johnsmeyer, . . . . .	Riley, Riley
Edith Grace Jones, . . . . .	Bendena, Doniphan
May Isabelle Kelly, . . . . .	Kansas City, <i>Missouri</i>
Olive Amanda Knapp, . . . . .	Leavenworth, Leavenworth
Edith May Koch, . . . . .	Fredonia, Wilson
Lena Marie Koch, . . . . .	Fredonia, Wilson
Gusta Krockner, . . . . .	Cheney, Sedgwick
Patience Lillian Laessig, . . . . .	Gypsum, Saline
Myra Grace Lawton, . . . . .	Newton, Harvey
Clara Leatherman, . . . . .	Dunavant, Jefferson
Althea Alice Leonard, . . . . .	Sterling, Rice
Alice Levine, . . . . .	Marysville, Marshall
Lydia Christena Linder, . . . . .	Randolph, Riley
Florence Edith Lindstrom, . . . . .	Cleburne, Riley
Letitia Long, . . . . .	Kansas City, Wyandotte
Margaret Clare Lutz, . . . . .	Holton, Jackson
Gertrude Lucile McCullough, . . . . .	Wichita, Sedgwick
Edna Luella McDonnell, . . . . .	Milford, Geary
Carrie Gladys McNitt, . . . . .	Stockton, Rooks
Jessie Marsh, . . . . .	Paola, Miami
Justina Martens, . . . . .	Buhler, Reno
Amy Matthews, . . . . .	Manhattan, Riley
Grace Lulu Matthew, . . . . .	Webster, Rooks
Anna Marie Maxwell, . . . . .	Cleburne, Riley
Naomi Frances Mickel, . . . . .	Lyndon, Osage
Ethel Vera Mills, . . . . .	Smith Center, Smith
Nancy Mabel Montgomery, . . . . .	Superior, <i>Nebraska</i>
Abbie T. More, . . . . .	Anness, Sedgwick
Ruby K. More, . . . . .	Anness, Sedgwick
Nina Marie Myers, . . . . .	Manhattan, Riley
Lela Myrtle Norton, . . . . .	Hiawatha, Brown
Alice Eugenia Olson, . . . . .	Manhattan, Riley
Hannah Josefine Olson, . . . . .	Windom, McPherson
Minnie Sylvia Olson, . . . . .	Parsons, Labette
Ella Annette Oman, . . . . .	Leonardville, Riley
Edna O'Neill, . . . . .	Winchester, Jefferson
Mae K. Orr, . . . . .	Buffalo, Wilson
Alma Ellene Parker, . . . . .	Waterville, Marshall
Sarah Ruth Peters, . . . . .	Kinsley, Edwards
Ruth Adolphine Peterson, . . . . .	Randolph, Riley
Mildred Esther Pettit, . . . . .	Peabody, Marion
Anna Poland, . . . . .	Lyons, Rice
Nellie Purdy, . . . . .	Manhattan, Riley
Blanch Lenella Purinton, . . . . .	Banner, Trego
Gladys Reed, . . . . .	Kinsley, Edwards
Mary Reed, . . . . .	Manhattan, Riley
Pearl Reilly, . . . . .	Iola, Allen
May Belle Rice, . . . . .	Ashland, Clark
Esther Ross, . . . . .	Montrose, Jewell
Jocie Ruggles, . . . . .	Altoona, Wilson
Lulu Ruggles, . . . . .	Altoona, Wilson
Agnes Marie Sanderson, . . . . .	Cleburne, Riley
Alice M. Schermerhorn, . . . . .	Manhattan, Riley
May Seiber, . . . . .	Great Bend, Barton
Edith Belle Sellers, . . . . .	Great Bend, Barton
Clinnie Sigman, . . . . .	Colby, Thomas
Mary Elizabeth Skillin, . . . . .	Lebanon, Smith
Lelia Bay Smith, . . . . .	Kansas City, <i>Missouri</i>
Myrtle Louna Smith, . . . . .	Enterprise, Dickinson
Frances May Stafford, . . . . .	Salina, Saline
(Mrs.) Alice K. Stansbury, . . . . .	Colorado Springs, <i>Colorado</i>
Elizabeth Surber, . . . . .	Kiowa, Barber
Hazel May Taylor, . . . . .	Chapman, Dickinson
Mahala Katherine Thatcher, . . . . .	Manhattan, Riley
Ethel Inez Theis, . . . . .	Wichita, Sedgwick
Lena Sara Trovinger, . . . . .	Cosherton, <i>Ohio</i>
Eva Belle Tubbs, . . . . .	Manhattan, Riley
Elsie Jane Tucker, . . . . .	Alton, Osborne
Margaret Marie Tucker, . . . . .	Alton, Osborne
Florence Kate Venneberg, . . . . .	Havensville, Pottawatomie
May Altie Venneberg, . . . . .	Havensville, Pottawatomie
Margaret Vest, . . . . .	Topeka, Shawnee
Nita L. Welch, . . . . .	Washington, Washington
Genevieve Lucy Weston, . . . . .	Frankfort, Marshall
Alta M. White, . . . . .	Clay Center, Clay
Melissa Williamson, . . . . .	Renfrow, <i>Oklahoma</i>
Gertrude Allen Wilson, . . . . .	Kansas City, Wyandotte

HOUSEKEEPERS' COURSE—*continued.*

<i>Names</i>	<i>Post office (county or state)</i>
(Mrs.) Nellie Winship, . . . . .	Manhattan, Riley
Ella Wittorff, . . . . .	Inman, McPherson
Ruth Sarah Yocum, . . . . .	Saint John, Stafford

## FARMERS' SHORT COURSE, SECOND YEAR

Oliver Harry Abercrombie, . . . . .	Gaylord, Smith
Albert Peter Adam, . . . . .	Wakefield, Clay
Fred Wesley Barker, . . . . .	Burns, Marion
Carrol Francis Barr, . . . . .	Westmoreland, Pottawatomie
Walter Wesley Beggs, . . . . .	Ensign, Gray
Arthur William Bicker, . . . . .	Dunlap, Morris
Walter Gotlieb Bircher, . . . . .	Kanopolis, Ellsworth
Howard Walter Bower, . . . . .	Vermilion, Marshall
Matthew Newton Bradley, . . . . .	Neosho Falls, Woodson
William Esty Burch, . . . . .	Leoti, Wichita
Ralph Owen Button, . . . . .	Elmont, Shawnee
Frank Carlson, . . . . .	Concordia, Cloud
Ira Walter Clark, . . . . .	Garfield, Pawnee
Bryan John Clemons, . . . . .	Centralia, Nemaha
Charles Elwood Conner, . . . . .	Manhattan, Riley
Wilson Counts, . . . . .	Baldwin, Douglas
Verne Allen Cozine, . . . . .	Linn, Washington
Wayne Ambrose DeLair, . . . . .	Coldwater, Comanche
Frank Dickerson, . . . . .	Neola, Stafford
Charles Emil Dralle, . . . . .	Seward, Stafford
William Delane Dunlap, . . . . .	Ottawa, Franklin
Roy Elmer Englund, . . . . .	Falun, Saline
Walter Lewis Fair, . . . . .	Webber, Jewell
Charles Monroe Fanshier, . . . . .	Great Bend, Barton
John Henry Fanshier, . . . . .	Great Bend, Barton
Charles Huntington French, . . . . .	Silver Lake, Shawnee
Lee Loren Fuller, . . . . .	Beloit, Mitchell
Earl David Gere, . . . . .	Stafford, Stafford
Clarence Edwin Gore, . . . . .	Seward, Stafford
Paul Hahn, . . . . .	Muncie, Wyandotte
Merlin Joy Hammett, . . . . .	Marysville, Marshall
Walter Jacob Hauptli, . . . . .	Glen Elder, Mitchell
Willard Henry Hayden, . . . . .	Lawrence, Douglas
Robert Arthur Hegle, . . . . .	Lost Springs, Marion
George Hobbie, . . . . .	Tipton, Mitchell
Ernest Hull, . . . . .	Wellington, Sumner
Paul Ernest Jacobson, . . . . .	Waterville, Marshall
Oscar Samuel Johnson, . . . . .	Macksville, Pawnee
Forrest Glenn Joss, . . . . .	Topeka, Shawnee
Perry Lester Keeney, . . . . .	Pawnee Station, Bourbon
William Irvin LaRosh, . . . . .	Osborne, Osborne
Carl Edward Larson, . . . . .	Smolan, Saline
John Gilbert Larson, . . . . .	Jamestown, Republic
Calvert Cotton McCandless, . . . . .	St. John, Stafford
James Harvey McGee, . . . . .	Olathe, Johnson
Israel Daniel Markley, . . . . .	Bennington, Ottawa
Arthur Wylie Martin, . . . . .	Eskridge, Wabaunsee
Thomas John Miner, . . . . .	Princeton, Franklin
Noah Musser, . . . . .	Abilene, Dickinson
George Meredith Newlin, . . . . .	Hutchinson, Reno
Wilmer Manton Parker, . . . . .	Morrill, Brown
Frank Oscar Pearson, . . . . .	Simpson, Mitchell
John Herbert Quinn, . . . . .	Bennington, Ottawa
Harold Jay Reynolds, . . . . .	Kansas City, <i>Missouri</i>
Clifford Eugene Rundell, . . . . .	Stafford, Stafford
John Andrew Schoen, . . . . .	Cawker City, Mitchell
Roy John Sellers, . . . . .	Osawatimie, Miami
Frederick W. Sewell, . . . . .	Coffeyville, Montgomery
Samuel Joseph Shaner, . . . . .	Riley, Riley
Harry Rudolph Sommer, . . . . .	Hope, Dickinson
Thomas Joseph Sommer, . . . . .	Hope, Dickinson
Archie Green Sowers, . . . . .	Leon, Butler
Franze Esper Stewart, . . . . .	Haviland, Kiowa
Howard McKinley Tilzey, . . . . .	Tipton, Mitchell
Reuben Samuel Vilander, . . . . .	Manhattan, Riley
Frank Joseph Wacek, . . . . .	Irving, Marshall
Walter Walker, . . . . .	Cunningham, Kingman
Issachar Henry Warfield, . . . . .	Manhattan, Riley
Troy Irtis Warran, . . . . .	Attica, Harper
John Clarence Wilke, . . . . .	Troy, Doniphan
Robert Rainey Wylie, . . . . .	Eskridge, Wabaunsee

## FARMERS' SHORT COURSE, FIRST YEAR

<i>Names</i>	<i>Post office (county or state)</i>
Clarence Gus Aaron, . . . . .	Leavenworth, Leavenworth
Arthur Arner, . . . . .	Lane, Franklin
Charles Ernest Arnold, . . . . .	Pratt, Pratt
Carl Assel, . . . . .	Weatherby, <i>Missouri</i>
Charles William Atwood, . . . . .	La Cygne, Linn
Roy Atwood, . . . . .	Wakefield, Clay
Francis Edward Auchard, . . . . .	Green, Clay
John William Barker, . . . . .	Pratt, Pratt
Rolen Barrett, . . . . .	Barrett, Marshall
Ray Betz, . . . . .	Asherville, Mitchell
Ira Blasdeil, . . . . .	Attica, Harper
Fred Elliot Blocher, . . . . .	Hanston, Hodgeman
Allie Rudolph Bollin, . . . . .	Leavenworth, Leavenworth
Paul E. Bossi, . . . . .	Arkansas City, Cowley
Herman William Braner, . . . . .	Herington, Dickinson
Samuel S. Brehm, . . . . .	Hutchinson, Reno
Mark Goodloe Brown, . . . . .	Larned, Pawnee
Earl Francis Bunge, . . . . .	Waverly, Coffey
DeWitt Calder, . . . . .	Bancroft, Nemaha
Chester Abraham Campbell, . . . . .	Howard, Elk
Francis Carroll, . . . . .	Agra, Phillips
Claude Cashatt, . . . . .	Oskaloosa, Jefferson
George Cleland, . . . . .	Hiattville, Bourbon
Lee Oscar Corsant, . . . . .	Salina, Saline
Edgar Andrew Cowles, . . . . .	El Dorado, Butler
Clare Elmer Davison, . . . . .	Hutchinson, Reno
Joseph Arthur Dick, . . . . .	Webber, Jewell
Vaugh Howard Doyle, . . . . .	Leonardville, Riley
Clarence Neal Eakins, . . . . .	Medicine Lodge, Barber
Ray Eaton, . . . . .	Williamsburg, Franklin
Herbert Bernard Ellis, . . . . .	Coldwater, Comanche
Victor Benjamin Ericson, . . . . .	Clyde, Cloud
Ray Foster, . . . . .	Portis, Osborne
James Franklin Francisco, . . . . .	Cimarron, Gray
Clarence John Fritsch, . . . . .	Manhattan, Riley
Emanuel Fromm, . . . . .	Elmo, Dickinson
Leo Eugene Ganoung, . . . . .	Plainville, Rooks
Elmer Arnold Gfeller, . . . . .	Junction City, Geary
Leonard Giles, . . . . .	Hutchinson, Reno
Merle Elbe Gill, . . . . .	Attica, Harper
Louis S. Gilmore, . . . . .	Manhattan, Riley
Andrew Waltermire Glentzer, . . . . .	Thayer, Neosho
Gerald Gordon, . . . . .	Severance, Doniphan
Merritt Hughes Gray, jr., . . . . .	Kansas City, <i>Missouri</i>
Raymond L. Green, . . . . .	Oswego, Labette
William Dwight Greene, . . . . .	Bazaar, Chase
John Griffith, . . . . .	Topeka, Shawnee
Edward G. Guilfoil, . . . . .	Wamego, Pottawatomie
Arthur George Haley, . . . . .	Bennington, Ottawa
Warren Aldrich Hallock, . . . . .	Ada, Ottawa
Fountain Hawkins, . . . . .	Summerfield, Marshall
John Rae Hefner, . . . . .	Concordia, Cloud
Louis William Heiken, . . . . .	Bushton, Rice
Charlie Conoin Helm, . . . . .	Wichita, Sedgwick
George Harvey Honeywell, . . . . .	Poe, Logan
Wiley Mitchell Hood, . . . . .	Haviland, Kiowa
Virgil Danie Howell, . . . . .	Garfield, Pawnee
Oscar Emanuel Johnson, . . . . .	Jamestown, Cloud
William Dever Johnston, . . . . .	Kansas City, <i>Missouri</i>
Lewis Howard Justus, . . . . .	Sterling, Rice
Chester Bonds Keck, . . . . .	Auburn, Shawnee
Russell Philip Keck, . . . . .	Auburn, Shawnee
Willie Grover Keller, . . . . .	Greensburg, Kiowa
William Thomas Knouse, . . . . .	Horton, Brown
Manassih Stewart Knox, . . . . .	Havensville, Pottawatomie
John Frank Komarek, . . . . .	Bavaria, Saline
Walter Evan Kroth, . . . . .	Soldier, Jackson
Ernest Henry Lange, . . . . .	Palmer, Washington
Henry August Lantz, . . . . .	Chapman, Dickinson
Anton Hamilton Larsen, . . . . .	Scandia, Republic
Gustav Theodore Larson, . . . . .	Everest, Brown
Lars Larson, . . . . .	Horton, Brown
Elbert Christian Lee, . . . . .	Phillipsburg, Phillips
Rollin Leedy, . . . . .	Cedar Vale, Chautauqua
John Crawford Lewis, . . . . .	Bogard, <i>Missouri</i>
Ernest Cyril Lindholm, . . . . .	Cheney, Sedgwick

FARMERS' SHORT COURSE, FIRST YEAR—*continued.*

<i>Names</i>	<i>Post office (county or state)</i>
Robert Donald McCallum, . . . . .	Elmdale, Chase
Charles V. Manninger, . . . . .	Harper, Harper
Emanuel Jesse Maninger, . . . . .	Harper, Harper
Emil Marshall, . . . . .	Clay Center, Clay
Walter Lee Mathes, . . . . .	Haviland, Kiowa
Roy Claud Megli, . . . . .	Glen Elder, Mitchell
Arden Loy Mellenbruch, . . . . .	Fairview, Brown
Harry Jackson Messick, . . . . .	Osborne, Osborne
William Mülham, . . . . .	Melvorn, Osage
Arthur Ray Miller, . . . . .	Deerhead, Barber
Wade Hampton Miller, . . . . .	Kansas City, <i>Missouri</i>
Buford George Mitchell, . . . . .	Kansas City, <i>Missouri</i>
John Fred Mueller, . . . . .	Sawyer, Pratt
John Phillip Navrat, . . . . .	Marion, Marion
Glen Gilbert Nicholas, . . . . .	Havensville, Pottawatomie
Thomas Pearson Oldham, . . . . .	Paola, Miami
Chester North Owen, . . . . .	Frankfort, Marshall
Mark Parkhurst, . . . . .	Kinsley, Edwards
John Patton, . . . . .	Chase, Rice
Charley Robert Peterson, . . . . .	Chapman, Dickinson
Ben Priess, . . . . .	Kinsley, Edwards
Otto Priess, . . . . .	Kinsley, Edwards
Frederick Brice Reed, . . . . .	Larned, Pawnee
Arthur Thomas Reeves, . . . . .	Conway Springs, Sumner
Samuel Regier, . . . . .	Moundridge, McPherson
Martin John Reinert, . . . . .	Reinert, Ford
Sigvart Odean Rodde, . . . . .	Jamestown, Cloud
Joseph Verne Rodkey, . . . . .	Irving, Marshall
Robert E. Lee Roglin, . . . . .	Quincy, Greenwood
James Lillard Rowan, . . . . .	Arkansas City, Cowley
Frank Rowland, . . . . .	Clay Center, Clay
Homer Wesley Russell, . . . . .	Wamego, Pottawatomie
William Ernest Sager, . . . . .	Edmond, Norton
Karl Alexander Saniter, . . . . .	Manhattan, Riley
Albert Harry Saxton, . . . . .	Everest, Brown
George Fred Schaal, . . . . .	Manhattan, Riley
Edward Paul Schlegel, . . . . .	Abilene, Dickinson
Cloyd Farmer Seaman, . . . . .	Osborne, Osborne
Thomas Samuel Shaw, . . . . .	Glade, Phillips
Charles Anderson Shimp, . . . . .	Oneida, Nemaha
Charles Frank Shoemaker, . . . . .	Phillipsburg, Phillips
Leoy Jonathan Slifer, . . . . .	Sterling, Rice
Flatt Noah Slough, . . . . .	Quincy, Greenwood
Charles Emary Smith, . . . . .	Willis, Brown
Carl Raymond Smith, . . . . .	Osborne, Osborne
Glen Godfrey Smith, . . . . .	Waverly, Coffey
Franklin Clemons Snow, . . . . .	Kansas City, Wyandotte
Harold Bank Speck, . . . . .	Sterling, Rice
Floyd Edward Spencer, . . . . .	McCune, Crawford
Samuel Stover, . . . . .	Friend, Finney
Max Rutherford Stuart, . . . . .	Leoti, Wichita
Charles Beech Swan, . . . . .	Leoti, Wichita
Harold Jenkins Swingle, . . . . .	Hazen, <i>Nevada</i>
Herbert Clifford Sylvester, . . . . .	Goodland, Sherman
Jesse Tangeman, . . . . .	Newton, Harvey
Erwin Trachsel, . . . . .	Goodland, Sherman
Del Aretus Valentine, . . . . .	Overbrook, Osage
Orville Van Meter, . . . . .	Hamburg, Iowa
Aart Alex Velthoen, . . . . .	Garnett, Anderson
Emery Cleford Vilander, . . . . .	Manhattan, Riley
Iver Morten Vollan, . . . . .	Jamestown, Cloud
Harold Francis Walker, . . . . .	Osborne, Osborne
Vernon Lee Wallace, . . . . .	Welda, Anderson
Thomas Gipson Walton, . . . . .	Fort Scott, Bourbon
John Johnson Wells, . . . . .	Elmdale, Chase
John Morrison Wells, . . . . .	Stockton, Rooks
Erwin George Weninger, . . . . .	Colwich, Sedgwick
Gus Dee Wheat, . . . . .	Deming, <i>New Mexico</i>
Leon Barton White, . . . . .	Clay Center, Clay
John K. Willems, . . . . .	Inman, McPherson
Frank Edward Williams, . . . . .	Harper, Harper
James Franklin Wilson, . . . . .	Manhattan, Riley
Marvin John Wineland, . . . . .	Covert, Osborne
Charles Wolf, . . . . .	Gaylord, Smith
Leslie P. Wylie, . . . . .	Clay Center, Clay
Otto Zacharias, . . . . .	Oak Mills, Atchison

## COMMERCIAL CREAMERY SHORT COURSE

<i>Names</i>	<i>Post office (county or state)</i>
Francis Andrew Boller, . . . . .	Manhattan, Riley
Stewart James Clarke, . . . . .	Marysville, Marshall
William Gibson Comin, . . . . .	Sterling, Rice
Alex Mort Davis, . . . . .	Manhattan, Riley
William Vernon Davis, . . . . .	Manhattan, Riley
Roy Ferguson, . . . . .	Cave, Gray
Percy Francis Morgan, . . . . .	Potwin, Butler
Charles Warren Quinn, . . . . .	Dwight, Morris
Harley Jewell Russell, . . . . .	Kansas City, Wyandotte
Elmer Weber, . . . . .	Salina, Saline
William Dysart Wilson, . . . . .	Manhattan, Riley
Frank Weeks Wood, . . . . .	Reading, Lyon

## Summary of Students, 1913-'14.

	Agronomy....		Horticulture..		Animal husbandry..		Dairy husbandry..		Veterinary medicine....		Mechanical engineering.		Electrical engineering.		Civil engineering.....		Architecture.		Home economics...		General science.....		Industrial journalism..		Miscellaneous.		Total.....		Grand total.....	
	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.	Men.
Graduate.....	45	12	29	12	13	10	8	17	7	135	23	12	1	3	3	31	33	31	33	31	33	31	33	31	33	31	33	31	33	64
Senior.....	44	9	28	11	14	19	29	6	7	122	19	13	1	3	3	31	33	31	33	31	33	31	33	31	33	31	33	31	33	327
Junior.....	70	15	53	4	14	21	41	20	9	150	23	6	1	8	8	31	33	31	33	31	33	31	33	31	33	31	33	31	33	324
Sophomore.....	70	15	53	4	14	21	41	20	9	150	23	6	1	8	8	31	33	31	33	31	33	31	33	31	33	31	33	31	33	324
Freshman.....	70	15	53	4	14	21	41	20	9	150	23	6	1	8	8	31	33	31	33	31	33	31	33	31	33	31	33	31	33	324
Special.....	70	15	53	4	14	21	41	20	9	150	23	6	1	8	8	31	33	31	33	31	33	31	33	31	33	31	33	31	33	324
School of Agriculture, special.	70	15	53	4	14	21	41	20	9	150	23	6	1	8	8	31	33	31	33	31	33	31	33	31	33	31	33	31	33	324
School of Agriculture, 1st year.	70	15	53	4	14	21	41	20	9	150	23	6	1	8	8	31	33	31	33	31	33	31	33	31	33	31	33	31	33	324
School of Agriculture, 2d year.	70	15	53	4	14	21	41	20	9	150	23	6	1	8	8	31	33	31	33	31	33	31	33	31	33	31	33	31	33	324
School of Agriculture, 3d year.	70	15	53	4	14	21	41	20	9	150	23	6	1	8	8	31	33	31	33	31	33	31	33	31	33	31	33	31	33	324
Housekeepers' Course.....	70	15	53	4	14	21	41	20	9	150	23	6	1	8	8	31	33	31	33	31	33	31	33	31	33	31	33	31	33	324
Farmers' Short Course, 1st year.	70	15	53	4	14	21	41	20	9	150	23	6	1	8	8	31	33	31	33	31	33	31	33	31	33	31	33	31	33	324
Farmers' Short Course, 2d year.	70	15	53	4	14	21	41	20	9	150	23	6	1	8	8	31	33	31	33	31	33	31	33	31	33	31	33	31	33	324
Commercial Creamery, Short Course.	70	15	53	4	14	21	41	20	9	150	23	6	1	8	8	31	33	31	33	31	33	31	33	31	33	31	33	31	33	324
Summer School.....	70	15	53	4	14	21	41	20	9	150	23	6	1	8	8	31	33	31	33	31	33	31	33	31	33	31	33	31	33	324
Total.....	159	36	112	24	60	78	126	56	27	596	96	43	19	3	3	19	43	19	43	19	43	19	43	19	43	19	43	19	43	3,186
Counted twice.....	159	36	112	24	60	78	126	56	27	596	96	43	19	3	3	19	43	19	43	19	43	19	43	19	43	19	43	19	43	3,186
Net total.....	159	36	112	24	60	78	126	56	27	596	96	43	19	3	3	19	43	19	43	19	43	19	43	19	43	19	43	19	43	3,027

\* All freshman in the division of agriculture, except veterinarians.



## Students by States and Counties, 1913-'14.

STATES AND TERRITORIES.			
Kansas	2,887	Missouri	39
Arizona	1	Nebraska	9
Arkansas	3	New Jersey	1
California	1	New Mexico	7
Colorado	4	New York	2
Georgia	1	Nevada	1
Hawaii	7	Ohio	4
Illinois	6	Oklahoma	9
Indiana	4	Pennsylvania	2
Iowa	6	Philippine Islands	1
Kentucky	1	South Dakota	2
Massachusetts	1	Texas	15
Minnesota	3	Wisconsin	1
Mississippi	1		
Total			3,020

FOREIGN COUNTRIES.			
China	2	Prussia	1
Jamaica	1	Russia	1
Mexico	3		
Total			5
Grand total, 3,027.			

KANSAS COUNTIES.			
Allen	16	Linn	18
Anderson	20	Logan	3
Atchison	15	Lyon	31
Barber	18	Marion	21
Barton	27	Marshall	54
Bourbon	9	McPherson	43
Brown	30	Meade	2
Butler	20	Miami	29
Chase	18	Mitchell	29
Chautauqua	4	Montgomery	13
Cherokee	2	Morris	16
Cheyenne	2	Morton	1
Clark	3	Nemaha	18
Clay	51	Neosho	12
Cloud	34	Ness	11
Coffey	20	Norton	6
Comanche	9	Osage	27
Cowley	31	Osborne	34
Crawford	8	Ottawa	17
Decatur	6	Pawnee	20
Dickinson	56	Phillips	25
Doniphan	12	Pottawatomie	43
Douglas	31	Fratt	14
Edwards	12	Rawlins	2
Elk	7	Reno	32
Ellis	8	Republic	34
Ellsworth	14	Rice	36
Finney	13	Riley	819
Ford	16	Rooks	20
Franklin	38	Rush	8
Geary	25	Russell	7
Gove	3	Scott	1
Graham	3	Saline	35
Grant	2	Sedgwick	80
Gray	7	Seward	8
Greeley	3	Shawnee	121
Greenwood	27	Sheridan	6
Hamilton	4	Sherman	6
Harper	30	Smith	22
Harvey	33	Stafford	22
Hedgson	3	Stanton	1
Jackson	42	Sumner	20
Jefferson	30	Thomas	4
Jewell	47	Trego	8
Johnson	21	Wabaunsee	31
Kearny	1	Wallace	5
Kingman	13	Washington	28
Kiowa	11	Wichita	6
Labette	29	Wilson	25
Lane	2	Woodson	17
Leavenworth	18	Wyandotte	62
Lincoln	29		
Total			2,887

## Record of Attendance, 1863-1914.

COLLEGE YEAR...	Summer School...	Home economics short course....	Commercial creamery short course....	Dairy short course.....	Farmers' short course.....	Apprentice.....	Special.....	Preparatory.....	Subfreshman.....	School of Agri-culture.....	Freshman.....	Sophomore.....	Junior.....	Senior.....	Graduate.....	Counted twice....	Total.....	Graduated.....
1863-64	...	...	...	...	...	...	...	93	...	...	14	...	...	...	...	...	107	...
1864-65	...	...	...	...	...	...	...	90	...	...	14	8	1	...	...	...	113	...
1866-67	...	...	...	...	...	...	...	154	...	...	11	7	1	5	...	...	178	5
1867-68	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	168	...
1868-69	...	...	...	...	...	...	...	146	...	...	11	10	2	...	1	...	170	...
1870-71	...	...	...	...	...	...	...	164	...	...	13	7	5	5	...	...	194	5
1871-72	...	...	...	...	...	...	...	162	...	...	22	10	3	2	3	...	202	3
**1873	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*217	5
1873-74	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	183	5
**1874	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	*243	...
**1875	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	237	2
**1876	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	303	5
**1877	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	228	9
1877-78	...	...	...	...	...	...	...	75	...	...	42	23	5	5	...	...	150	4
1878-79	...	...	...	...	...	...	1	...	...	...	89	89	16	12	...	...	207	9
1879-80	...	...	...	...	...	...	1	...	...	...	166	61	35	11	2	...	276	7
1880-81	...	...	...	...	...	...	6	...	...	...	178	48	24	9	2	...	267	8
1881-82	...	...	...	...	...	...	5	...	...	...	227	50	19	11	...	...	312	9
1882-83	...	...	...	...	...	...	4	...	...	...	241	60	30	12	...	...	347	12
1883-84	...	...	...	...	...	...	2	...	...	...	255	92	26	18	2	...	395	17
1884-85	...	...	...	...	...	...	2	...	...	...	271	71	36	16	5	...	401	14
1885-86	...	...	...	...	...	...	1	...	...	...	273	91	35	24	4	...	423	21
1886-87	...	...	...	...	...	...	...	...	...	...	303	100	44	24	10	...	481	21
1887-88	...	...	...	...	...	...	...	...	...	...	305	92	46	27	2	...	472	22
1888-89	...	...	...	...	...	...	...	...	...	...	266	103	41	28	7	...	445	25
1889-90	...	...	...	...	...	...	1	...	...	...	307	105	63	28	10	...	514	27
1890-91	...	...	...	...	...	...	...	...	...	...	343	135	50	53	12	...	593	52
1891-92	...	...	...	...	...	...	...	...	...	...	336	139	62	37	10	...	584	35
1892-93	...	...	...	...	...	...	...	...	...	...	339	110	66	43	29	...	587	39
1893-94	...	...	...	...	...	...	...	...	...	...	275	141	72	42	25	...	555	39
1894-95	...	...	...	...	...	...	5	...	...	...	276	108	89	64	30	...	572	57
1895-96	...	...	...	...	...	...	3	...	...	...	353	121	67	71	32	...	647	66
1896-97	...	...	...	...	...	...	6	67	...	...	321	163	69	62	46	...	734	55
1897-98	...	...	...	6	...	9	15	77	...	...	316	174	77	82	57	10	803	69
1898-99	...	...	...	...	...	...	...	...	...	...	306	177	92	65	40	21	870	53
1899-00	24	...	...	...	...	...	...	...	...	...	376	163	109	69	27	22	1094	58
1900-01	47	...	...	...	...	...	...	...	...	...	348	183	80	74	40	52	1321	60
1901-02	41	...	...	...	...	...	...	...	...	...	396	206	120	65	32	59	1396	52
1902-03	63	...	...	...	...	...	...	...	...	...	471	229	141	86	24	57	1574	55
1903-04	51	...	...	...	...	...	...	...	...	...	403	206	161	114	20	36	1605	102
1904-05	88	...	...	...	...	...	...	...	...	...	239	198	122	117	26	43	1462	107
1905-06	92	...	...	...	...	...	...	...	...	...	373	214	145	110	30	64	1690	96
1906-07	134	...	...	...	...	...	...	...	...	...	411	269	149	133	24	88	1987	119
1907-08	188	...	...	...	...	...	...	...	...	...	450	357	202	148	26	82	2192	116
1908-09	168	...	...	...	...	...	...	...	...	...	491	381	243	171	28	86	2308	139
1909-10	152	4	...	...	...	...	...	...	...	...	456	417	236	170	26	70	2305	146
1910-11	31	142	9	...	...	...	...	...	...	...	533	412	238	248	34	59	2407	204
1911-12	94	160	14	...	...	...	...	...	...	...	337	461	238	261	44	81	2523	230
1912-13	232	175	11	...	...	...	...	...	...	...	444	432	355	263	55	166	2923	232
1913-14	370	149	12	...	...	...	...	...	...	...	516	431	324	327	64	159	3027	...

\* Estimated.

\*\* Calendar year.

## Correspondence Courses

Figure following the name indicates the number of courses.

## READING COURSES

<i>Names</i>	<i>Post office (county or state)</i>
Mrs. Emma Arnold, . . . . .	Ottawa, Franklin
Alfred S. Alberty, . . . . .	Cherokee, Crawford
John Bain, jr. (3), . . . . .	Wichita, Sedgwick
John W. Barley (2), . . . . .	Garnett, Anderson
Mrs. Fannie Bedker, . . . . .	Stockton, Rooks
Mrs. Elza Bedker (2), . . . . .	Utica, Ness
J. H. Beecher, . . . . .	Genoa, Nebraska
J. F. Bernard, . . . . .	Hutchinson, Reno
Floyd Black, . . . . .	Bern, Nemaha
J. W. Bolton, . . . . .	Iola, Allen
Bertha R. Bowers (2), . . . . .	Circleville, Ohio
A. C. Boyer, . . . . .	Salina, Saline
Charles A. Boyle (4), . . . . .	Emporia, Lyons
Mrs. A. C. Carlberg, . . . . .	Chanute, Neosho
Mary E. Clayton, . . . . .	Admire, Lyons
W. E. Clayton, . . . . .	Admire, Lyons
Geo. W. Curtis, . . . . .	Topeka, Shawnee
Carl Dahlquist (2), . . . . .	Garfield, Pawnee
Percy G. Davis, . . . . .	Braymer, Missouri
Dr. E. L. Dicke (2), . . . . .	Louisburg, Miami
V. P. Dixon (2), . . . . .	Linwood, Leavenworth
J. F. Dreisbach (2), . . . . .	Hutchinson, Reno
Mollie Duncan (2), . . . . .	Platte City, Missouri
Fred C. Dymock, . . . . .	Wichita, Sedgwick
Mrs. Ray Eads, . . . . .	Cullison, Pratt
Amelia E. Ebersole, . . . . .	Superior, Nebraska
Foster Eskelund, . . . . .	Deerfield, Kearny
J. R. Estus (3), . . . . .	Arkansas City, Cowley
Dora Foraker, . . . . .	Pittsburg, Crawford
C. Edgar Funston, . . . . .	Lakin, Kearny
Will P. K. Gates, . . . . .	Wakefield, Clay
Guy Gebhardt, . . . . .	Bellefonte, Republic
A. E. Gledhill, . . . . .	Gaylord, Smith
Mrs. H. M. Gonsalves, . . . . .	Leavenworth, Leavenworth
G. H. Haines, . . . . .	Baxter Springs, Cherokee
Chester A. Hall (2), . . . . .	Richland, Shawnee
James W. Hall, . . . . .	Iola, Allen
F. C. Hendrickson, . . . . .	Dresden, Decatur
C. R. Henry, . . . . .	St. Francis, Cheyenne
Mrs. Charles V. Hesse, . . . . .	Wamego, Pottawatomie
Jesse Hill, . . . . .	Hudson, Stafford
F. A. Hodler (2), . . . . .	Beloit, Mitchell
Mrs. Anna E. Hopkins (Sec'y of Club), . . . . .	Tonganoxie, Leavenworth
Dr. W. H. Hudson (3), . . . . .	Atchison, Atchison
Charles Ivey (2), . . . . .	Quenemo, Franklin
C. M. Irvin, . . . . .	Wichita, Sedgwick
Reuben Johnson, . . . . .	Clifton, Washington
Myrtle Jump, . . . . .	Anthony, Harper
Paul D. Kennedy, . . . . .	Jewell, Jewell
G. A. Kibbe, . . . . .	Cherryvale, Montgomery
Joseph H. P. Klein, . . . . .	Chicago, Illinois
Ray Koontz (2), . . . . .	Lane, Franklin
Mrs. Allan Laing, . . . . .	Ames, Cloud
Royald H. Lapworth, . . . . .	Pittsburg, Crawford
W. H. Leahy, . . . . .	Concordia, Cloud
J. F. Lehman (2), . . . . .	Halstead, Harvey
J. W. Ledbetter, . . . . .	Canyon City, Colorado
H. R. Leland, . . . . .	Topeka, Shawnee
C. E. Lindell, . . . . .	Windom, McPherson
W. A. Little, . . . . .	Holton, Jackson
Mrs. E. K. Lord, . . . . .	Emporia, Lyon
W. J. Lott, . . . . .	Junction City, Geary
C. E. McCarty (2), . . . . .	Dodge City, Ford
Owen McCarty, . . . . .	Concordia, Cloud
R. McKinney (2), . . . . .	Atchison, Atchison
R. L. Macy, . . . . .	Longford, Clay

CORRESPONDENCE—READING COURSES—*continued.*

<i>Names</i>	<i>Post office (county or state)</i>
Ralph E. Marble, . . . . .	Esbon, Jewell
Mary Marshall (2), . . . . .	Wichita, Sedgwick
Leonard Massengill, . . . . .	Caldwell, Sumner
George Mellard (2), . . . . .	Russell, Russell
I. P. Morehouse (2), . . . . .	Elk Falls, Elk
W. A. Morgan, . . . . .	Alta Vista, Wabaunsee
W. H. Morgan, . . . . .	Lansing, Leavenworth
John Myers, . . . . .	St. Francis, Cheyenne
H. A. Nelson, . . . . .	Brookville, Saline
H. H. Neumann (secretary of club), . . . . .	Hanover, Washington
R. P. Nevin, . . . . .	Pittsburg, Crawford
W. A. Oakley (2), . . . . .	Beloit, Mitchell
Harlen A. Odell, . . . . .	Fredonia, Wilson
C. E. Payne (secretary of club), . . . . .	Fontana, Miami
Blanche Peters, . . . . .	Bucklin, Ford
Peter Peterson, . . . . .	Falun, Saline
David Phillips, . . . . .	Lawrence, Douglas
Geo. H. Phinney, . . . . .	Maxwell, <i>California</i>
Edwin Pinkham (3), . . . . .	Mentor, Saline
Howard Porter, . . . . .	Washington, Washington
Mrs. A. B. Randolph, . . . . .	Arkansas City, Cowley
I. I. Reeve (4), . . . . .	Lone Elm, Anderson
Sam Regier, . . . . .	Moundridge, McPherson
Joseph W. Reid, . . . . .	Kansas City, <i>Missouri</i>
O. E. Replogle (secretary of club), . . . . .	Meriden, Jefferson
C. E. Rettig, . . . . .	Chanute, Neosho
John R. Roe, . . . . .	Russell, Russell
Harry Ross, . . . . .	Bronson, Bourbon
Charles Runyan (2), . . . . .	Marion, Marion
Mrs. J. M. Ryan (secretary of club), . . . . .	Muscotah, Atchison
E. D. Samson, . . . . .	Quinter, Gove
C. Walter Sander (2), . . . . .	Stockton, Rooks
Joy Sanders, . . . . .	Topeka, Shawnee
W. H. Scarritt, . . . . .	Kansas City, <i>Missouri</i>
Mrs. Ella Schiffbauer (secretary of club), . . . . .	Arrington, Atchison
Charles Schroeder, . . . . .	Tully, Rawlins
C. F. Schupbach (3), . . . . .	Hiawatha, Brown
Harley Sherwood (3), . . . . .	Chester, <i>Nebraska</i>
E. L. Simonton, . . . . .	Wamego, Pottawatomie
C. A. Smith (2), . . . . .	Scandia, Republic
Ernest Sowers, . . . . .	Dunlap, Morris
Charles Stein (2), . . . . .	Glasco, Cloud
Dennis Stewart, . . . . .	Beloit, Mitchell
F. H. Tarnstrom, . . . . .	Lindsborg, McPherson
J. H. Taylor, . . . . .	Chapman, Dickinson
Alfred Tebow (2), . . . . .	Jamestown, Cloud
H. H. Thompson, . . . . .	Tecumseh, Shawnee
Charles Topping, . . . . .	Lawrence, Douglas
J. L. Trece, . . . . .	Alma, Wabaunsee
George C. Trelick, . . . . .	Kingman, Kingman
Robert Turner, . . . . .	Fort Logan, <i>Colorado</i>
B. F. Verhage (2), . . . . .	La Cygne, Linn
O. G. Warren, . . . . .	Webber, Jewell
William Charles Washburn (3), . . . . .	Elkhart, Morton
Lofton White (2), . . . . .	Elk Falls, Elk
Ray Wickliffe (2), . . . . .	Seneca, Nemaha
Bessie Wiggs, . . . . .	Coffeyville, Montgomery
Roy Williams, . . . . .	Elk Falls, Elk

## EXTENSION COURSES

W. C. Adams, . . . . .	Hoxie, Sheridan
G. E. Alexander, . . . . .	Medicine Lodge, Barber
John W. Allen, . . . . .	Independence, Montgomery
Andrew Anderson, . . . . .	Frankfort, Marshall
A. L. Anderson, . . . . .	Leavenworth, Leavenworth
L. Anderson, . . . . .	Leavenworth, Leavenworth
Ruth Balderson, . . . . .	Louisville, Pottawatomie
James Bane, . . . . .	East Hiawatha, <i>Utah</i>
Marion A. Barlow, . . . . .	Burlingame, Osage
J. W. Barron (2), . . . . .	Kirwin, Phillips
John P. Barta, . . . . .	Ottawa, Franklin
Mrs. J. T. Bayer, . . . . .	Yates Center, Woodson
F. M. Bealey, . . . . .	Morrill, Brown
O. R. Becker, . . . . .	Atchison, Atchison
H. H. Beedles, . . . . .	Reece, Greenwood
S. S. Beggs, . . . . .	Topeka, Shawnee
John Blecha (2), . . . . .	Severy, Greenwood
Percy C. Blown, . . . . .	San Antonio, <i>Texas</i>

CORRESPONDENCE—EXTENSION COURSES—*continued.*

<i>Names</i>	<i>Post office (county or state)</i>
P. F. Boese, . . . . .	Buhler, Reno
Frank G. Boone, . . . . .	Toronto, Woodson
L. J. Bowen, . . . . .	Bloomington, Osborne
James Bowers, . . . . .	Lawrence, Douglas
Carl Broberg, . . . . .	Vesper, Lincoln
Flossie L. Brown, . . . . .	Garden City, Finney
Fred W. Brown, . . . . .	Sylvan Grove, Lincoln
J. V. Brown, . . . . .	Wichita, Sedgwick
Thomas W. Bruner (2), . . . . .	Oanica, Kearny
E. S. Burns, . . . . .	Argonia, Sumner
Robert Cahill, . . . . .	Horton, Brown
Frank Chase, . . . . .	Iola, Allen
Roy H. Clark, . . . . .	Salina, Saline
Mary E. Clayton, . . . . .	Admire, Lyon
Mrs. W. E. Clayton, . . . . .	Admire, Lyon
C. C. Coleman, . . . . .	Sylvia, Reno
Grover Collins, . . . . .	San Antonio, Texas
Carl Cook, . . . . .	Kirwin, Phillips
Frederick Cook, . . . . .	Kirwin, Phillips
William R. Cook, . . . . .	Altamont, Labette
Meta Crampton, . . . . .	Arkansas City, Cowley
E. W. Dales, . . . . .	Eureka, Greenwood
Oscar Dahlgren (2), . . . . .	Clay Center, Clay
A. C. Dannenberg, . . . . .	Hiawatha, Brown
Earl J. DeLong, . . . . .	Emporia, Lyon
A. C. Dickman, . . . . .	Fostoria, Pottawatomie
Earl Dixon, . . . . .	Essex, Finney
Walter Dolsby (2), . . . . .	Norton, Norton
LaVonia M. Donica, . . . . .	Bayard, Allen
Paul Drevets, . . . . .	Smolan, Saline
Mollie Duncan, . . . . .	Platte City, Missouri
Roy Ensminger, . . . . .	Moran, Allen
H. H. Ernstman, . . . . .	Wichita, Sedgwick
Harvey Eshelman (2), . . . . .	Enterprise, Dickinson
Eva M. Fearing, . . . . .	Burr Oak, Jewell
H. M. Fearing, . . . . .	Burr Oak, Jewell
Mrs. C. A. Fees, . . . . .	Wichita, Sedgwick
C. A. Fees, . . . . .	Wichita, Sedgwick
C. E. Felch, . . . . .	Hardy, Nebraska
Esther Fieser, . . . . .	Norwich, Kingman
James Fishburn, . . . . .	Logan, Phillips
T. E. Flanders, . . . . .	Springhill, Johnson
Nora Foraker, . . . . .	Wellington, Sumner
O. T. Franzell, . . . . .	Atchison, Atchison
Mrs. Alice Frederick, . . . . .	Edmond, Norton
Otto Freienmuth, . . . . .	Tonganoxie, Leavenworth
Henry Friesen (2), . . . . .	Buhler, Reno
Hugh Fuller, . . . . .	Horton, Brown
Charles S. Fulton (2), . . . . .	Hutchinson, Reno
W. L. Funk (2), . . . . .	Raymore, Missouri
C. Edgar Funston, . . . . .	Deerfield, Kearny
Mrs. Ellen Geffert, . . . . .	Greenleaf, Washington
Roy E. Gish, . . . . .	Abilene, Dickinson
James Orris Gitchell, . . . . .	Little River, Rice
R. B. Glass, . . . . .	Lakin, Kearny
W. J. Glenn, . . . . .	Waverly, Coffey
H. P. Goodell, . . . . .	Hutchinson, Reno
Clara Goodrich, . . . . .	Mankato, Jewell
G. J. Graber, . . . . .	Pretty Prairie, Reno
R. H. Graham, . . . . .	Salina, Saline
J. S. Grove, . . . . .	Kansas City, Wyandotte
William Gumpell, . . . . .	Gypsum, Saline
Lee Haas, . . . . .	Durham, Marion
Carl Halberg, . . . . .	Burlingame, Osage
T. D. Hammatt, . . . . .	Topeka, Shawnee
Elmer Hart, . . . . .	Coffeyville, Montgomery
Wilbert Hart, . . . . .	Liberty, Montgomery
Fred Hartwell, . . . . .	Goodland, Sherman
Edward Harvey, . . . . .	Parsons, Labette
Edward Harbaugh, . . . . .	Wellington, Sumner
W. A. Harvey, . . . . .	Fowler, Meade
John A. Harvey, . . . . .	Ogden, Riley
Mrs. Luella J. Harwood, . . . . .	Winfield, Cowley
Ray Hawkins, . . . . .	Ness City, Ness
E. E. Heaps, . . . . .	Parsons, Labette
Mrs. P. F. Hederhorst, . . . . .	Stockton, Rooks
Roy T. Helm, . . . . .	Topeka, Shawnee
Harvey Hibner, . . . . .	Lawrence, Douglas
J. M. Hickey, . . . . .	Preston, Pratt
Elmer Higgins, . . . . .	Mayetta, Jackson

CORRESPONDENCE—EXTENSION COURSES—*continued.*

<i>Names</i>	<i>Post office (county or state)</i>
Albert I. Hill, . . . . .	Burlington, Coffey
C. E. Hollenbeck, . . . . .	Linwood, Leavenworth
Clyde E. Horn, . . . . .	Stafford, Stafford
John Horrigan, . . . . .	Topeka, Shawnee
Jennie Houdik, . . . . .	Cuba, Republic
O. W. Howard, . . . . .	Brewster, Thomas
Richard Hulland, . . . . .	Rosedale, Johnson
H. M. Hunter (2), . . . . .	Topeka, Shawnee
Gertrude Hymmer (2), . . . . .	Belle Plaine, Sumner
Sophus Johnson (2), . . . . .	Hays, Ellis
G. H. Judd, . . . . .	Bigelow, Marshall
W. L. Jacobs, . . . . .	Great Bend, Barton
H. L. Jennison, . . . . .	Dighton, Lane
H. C. Jent, . . . . .	Wamego, Pottawatomie
Eugene Jones, . . . . .	Burlington, Coffey
Emil Kaaz, . . . . .	Atchison, Atchison
C. L. Kellenberger, . . . . .	Bern, Nemaha
J. H. Kelly, . . . . .	Hoisington, Barton
Rex Kemper, . . . . .	Hoisington, Barton
W. E. Kendall, . . . . .	Glade, Phillips
George Kershner, . . . . .	Hutchinson, Reno
F. M. King, . . . . .	Geuda Springs, Sumner
Mrs. F. M. King, . . . . .	Geuda Springs, Sumner
Margaret Klassen, . . . . .	Inman, McPherson
Ira T. Koogle, . . . . .	Chapman, Dickinson
Ray Koontz, . . . . .	Lane, Franklin
Rollo Krouse, . . . . .	Stockton, California
Edith Lamb, . . . . .	Alamota, Lane
J. C. Laney, . . . . .	San Antonio, Texas
D. E. Langenwalter, . . . . .	Halsted, Harvey
Anna M. Larson, . . . . .	Lindsborg, McPherson
Fred H. Leidigh, . . . . .	Hutchinson, Reno
Bertha Lemley, . . . . .	Genoa, Nebraska
Ansel E. Leslie, . . . . .	Nickerson, Reno
Joseph Levin, . . . . .	Lindsborg, McPherson
W. A. Little, . . . . .	Holton, Jackson
Charles H. Loomis (2), . . . . .	Merriam, Johnson
Dr. Harry W. Lukins, . . . . .	Highland, Doniphan
Mrs. Laura Lyman, . . . . .	Garfield, Pawnee
B. C. McClelland, . . . . .	Milo, Lincoln
R. S. McElwain (2), . . . . .	Lyons, Rice
Harry S. McKay, . . . . .	Parsons, Labette
C. W. McKeage, . . . . .	Hoyt, Jackson
T. H. McKittrick, . . . . .	McCracken, Rush
Rose Malicky, . . . . .	Oketo, Marshall
A. W. Matthies, . . . . .	Buhler, Reno
W. H. Maxwell, . . . . .	Topeka, Shawnee
Lloyd Miller, . . . . .	Valencia, Shawnee
Minnie Miller, . . . . .	Milford, Geary
F. O. Moody, . . . . .	Olathe, Johnson
Blaine Monroe, . . . . .	Lansing, Leavenworth
Chester H. Moon, . . . . .	El Dorado, Butler
Irma L. Moore, . . . . .	Holton, Jackson
Ray E. Morrill, . . . . .	Summerfield, Marshall
H. F. Morsebach, . . . . .	Medicine Lodge, Barber
T. J. Mullins, . . . . .	Junction City, Geary
H. A. Nelson, . . . . .	Brookville, Saline
W. H. Nelson, . . . . .	Smith Center, Smith
J. E. Nicholson, . . . . .	Atchison, Atchison
Ray Nigus, . . . . .	Hiawatha, Brown
John Nitcher (2), . . . . .	Hardy, Nebraska
J. H. Nonamaker, . . . . .	Osborne, Osborne
E. H. Norris (2), . . . . .	Clafin, Barton
Gage Olson, . . . . .	Topeka, Shawnee
Leonard Pacey, . . . . .	Miltonvale, Cloud
Henry Pae, . . . . .	Concordia, Cloud
E. A. D. Parker, . . . . .	Concordia, Cloud
Murvale E. Parnell (2), . . . . .	Haviland, Kiowa
H. A. Pennington, . . . . .	Hutchinson, Reno
Ernst Peters (2), . . . . .	Walton, Harvey
Alfred Peterson, . . . . .	Garrison, Pottawatomie
Geo. M. Petrie, . . . . .	Argonia, Sumner
Geo. H. Phinney, . . . . .	Maxwell, California
Garra Piburn, . . . . .	Kansas City, Wyandotte
S. V. Pihl, . . . . .	Lindsborg, McPherson
Lela Plush, . . . . .	Penalosa, Kingman
A. J. Pottorf (2), . . . . .	Riley, Riley
Frank W. Pollock, . . . . .	Lansing, Leavenworth
I. L. Pike, . . . . .	Abilene, Dickinson

CORRESPONDENCE—EXTENSION COURSES—*continued.*

<i>Names</i>	<i>Post office (county or state)</i>
Lem M. Raley, . . . . .	Lansing, Leavenworth
John M. Rankin, . . . . .	Kansas City, Wyandotte
Wm. E. Ready, . . . . .	Lansing, Leavenworth
Geo. B. Reed, . . . . .	Richland, Franklin
Henry Reh, . . . . .	Homewood, Franklin
C. E. Rettig, . . . . .	Chanute, Neosho
Mrs. T. F. Rhodes, . . . . .	Frankfort, Marshall
John Richardson, . . . . .	Medicine Lodge, Franklin
James Richardson, . . . . .	Lawrence, Douglas
Rudolph Rickenberg, . . . . .	Sylvan Grove, Lincoln
A. E. Rix, . . . . .	Emporia, Lyons
Charles Robertshaw, . . . . .	Wilson, Ellsworth
G. O. Roos, . . . . .	Kankakee, Illinois
Hall Rumble, . . . . .	Chanute, Neosho
W. E. Russell (2), . . . . .	Oak Valley, Elk
Edna Sable, . . . . .	Argentine, Wyandotte
U. S. Sandlin, . . . . .	Ashland, Clark
Louise K. Schascht, . . . . .	Santa Fe, New Mexico
W. A. Schraeder, . . . . .	Kansas City, Missouri
Charles Schroeder, . . . . .	Tully, Rawlins
Charles L. Scott, . . . . .	Miltonvale, Cloud
H. J. Schwarz (2), . . . . .	Lebanon, Smith
C. B. Sherlock, . . . . .	Lansing, Leavenworth
Elmer E. Short, . . . . .	Topeka, Shawnee
Paul F. Shuck, . . . . .	Greensburg, Kiowa
Laura Siegrist, . . . . .	Simpson, Mitchell
Cecil H. Smith, . . . . .	Cruce, Oklahoma
J. P. F. Smith, . . . . .	Kansas City, Wyandotte
B. W. Snyder, . . . . .	St. John, Stafford
Alvah Souder (2), . . . . .	Newton, Harvey
J. B. Souder, . . . . .	Newton, Harvey
Fred Spinden, . . . . .	Burns, Marion
Mrs. Florence Stephens (2), . . . . .	Lucas, Russell
H. M. Stewart, . . . . .	Alden, Rice
Walter A. Stewart, . . . . .	Lansing, Leavenworth
Mrs. E. N. Stites, . . . . .	Hope, Dickinson
Everett Storer, . . . . .	Alton, Osborne
Sterling Russell Stover, . . . . .	Iola, Allen
V. R. Tate, . . . . .	Atchison, Atchison
H. H. Thompson (2), . . . . .	Tecumseh, Shawnee
Brownhill Tidball, . . . . .	Wa Keeney, Trego
McKinley Tidball, . . . . .	Wa Keeney, Trego
Mrs. R. W. Titus, . . . . .	Galena, Cherokee
E. H. Todd (2), . . . . .	Salina, Saline
Charles Topping, . . . . .	Lawrence, Douglas
Earl W. Tracy, . . . . .	San Antonio, Texas
Geo. C. Tredick, . . . . .	Kingman, Kingman
Edna Ullom (2), . . . . .	Paola, Miami
Susie Unruh, . . . . .	Goessel, Marion
W. L. Walker, . . . . .	Pittsburg, Crawford
B. K. Walters, . . . . .	Zeandale, Riley
W. E. Waterman, . . . . .	Peabody, Marion
Laura B. Weickert (2), . . . . .	La Cygne, Linn
I. J. Wenger, . . . . .	Aberdeen, Idaho
Peter Werner, . . . . .	Tecumseh, Shawnee
W. R. Whiteacre, . . . . .	Winfield, Cowley
Russell T. Wilcox, . . . . .	Burlingame, Osage
John R. Williams, . . . . .	Wellsville, Franklin
Ada B. Williford, . . . . .	Coleman, Texas
Hazel Wilson, . . . . .	Leoti, Wichita
S. R. Winsor, . . . . .	Wakefield, Clay
B. H. Wright, . . . . .	Ottawa, Franklin
John H. Wright, . . . . .	Wilmore, Comanche
J. M. Zerbe, . . . . .	Syracuse, Hamilton

## CREDIT COURSES

Carl Adams, . . . . .	Washington, Washington
John A. Anderson, . . . . .	Ottawa, Franklin
Sylvia Baker (2), . . . . .	Towanda, Butler
Otis Barker, . . . . .	Phillipsburg, Phillips
John W. Barley, . . . . .	Garnett, Anderson
J. H. Beecher, . . . . .	Genoa, Nebraska
Roy C. Beezley, . . . . .	Girard, Crawford
Charles Bell, . . . . .	Kinsley, Edwards
Ephraim Billings, . . . . .	Lindsborg, McPherson
Ruth Bitter, . . . . .	La Crosse, Rush
Floyd Black, . . . . .	Bern, Nemaha
C. H. Brooks, . . . . .	Atwood, Rawlins

CORRESPONDENCE—CREDIT COURSES—*continued.*

<i>Names</i>	<i>Post office (county or state)</i>
Thomas W. Brophy, . . . . .	Lansing, Leavenworth
Edmond T. Brothers, . . . . .	Winfield, Cowley
Arthur Browne, . . . . .	Burdett, Pawnee
Hattie A. Burnham (2), . . . . .	Lovewell, Jewell
Fred Carp, . . . . .	Wichita, Sedgwick
Ira Chapman (3), . . . . .	Milford, Geary
Hattie Cleavinger, . . . . .	Linwood, Leavenworth
M. D. Collins, . . . . .	Abilene, Dickinson
Robert T. Corbin, . . . . .	Canton, McPherson
James W. Cowles, . . . . .	Muskogee, <i>Oklahoma</i>
George E. Denman (2), . . . . .	Manhattan, Riley
Virginia Dodd, . . . . .	Langdon, Reno
A. Doryland, . . . . .	Manhattan, Riley
Ethel Downing, . . . . .	Garden City, Finney
Harry D. Dunavan, . . . . .	Kansas City, <i>Missouri</i>
Renny W. Duston (2), . . . . .	Washington, Washington
Louisa Dyer, . . . . .	Riley, Riley
Fred R. Eastman, . . . . .	Matfield Green, Chase
R. C. Ennefer, . . . . .	Pleasanton, Linn
Robert Erickson, . . . . .	El Dorado, Butler
H. H. Ernstmann (2), . . . . .	Wichita, Sedgwick
John H. Errebo (2), . . . . .	Vesper, Lincoln
Nellie F. Farnsworth, . . . . .	Portis, Osborne
E. H. Fenton, . . . . .	Kansas City, <i>Missouri</i>
S. E. Ferguson, . . . . .	Mullinville, Kiowa
Ray Ferree (2), . . . . .	Scott City, Scott
John J. Fowler, . . . . .	Jewell City, Jewell
Frank Fisher, . . . . .	Horton, Brown
Peter A. Friesen (2), . . . . .	Burton, Harvey
Samuel Garekol, . . . . .	Calverton, <i>Maryland</i>
Roy W. Gates, . . . . .	Pittsburg, Crawford
L. W. Gearhart, . . . . .	Clearfield, <i>Pennsylvania</i>
R. W. Getty, . . . . .	La Harpe, Allen
J. M. Gilman (4), . . . . .	Leavenworth, Leavenworth
Mrs. Ida Givens, . . . . .	Butler, <i>Indiana</i>
Mrs. H. M. Gonsalves, . . . . .	Leavenworth, Leavenworth
J. M. Goodwin, . . . . .	Asherville, Mitchell
Silvanus Gordon, . . . . .	Sergeantville, <i>New Jersey</i>
Chu S. Gunn, . . . . .	New York, <i>New York</i>
Frank S. Hagy, . . . . .	Bunker Hill, Russell
T. D. Hammatt, . . . . .	Topeka, Shawnee
Alice Harkness (2), . . . . .	Lakin, Kearny
Lola Hartwell, . . . . .	Frankfort, Marshall
Margaret Hartwig, . . . . .	Goodland, Sherman
E. C. Harvey, . . . . .	South Omaha, <i>Nebraska</i>
Floyd Hawkins (3), . . . . .	Marysville, Marshall
Walter A. Hepler (2), . . . . .	Manhattan, Riley
Charles Hetrick, . . . . .	Kearney, <i>Nebraska</i>
Frank Howard (2), . . . . .	Oakley, Logan
G. H. Hower, . . . . .	Cottonwood Falls, Chase
H. M. Hunter, . . . . .	Topeka, Shawnee
F. W. Huntington (2), . . . . .	Silver Lake, Shawnee
Gilford Ikenberry (2), . . . . .	Quinter, Gove
D. L. Irwin (2), . . . . .	Argonia, Sumner
Henry Jacobs, . . . . .	Latham, Butler
Morris James, . . . . .	Gridley, Coffey
Vera Johnsmeyer (3), . . . . .	Riley, Riley
F. C. Johnson, . . . . .	Mesa, <i>Arizona</i>
O. H. Johnson, . . . . .	River Falls, <i>Wisconsin</i>
Alice M. Keith, . . . . .	Ottawa, Franklin
Mildred Kirkwood, . . . . .	Marysville, Marshall
Henry Lacerte, . . . . .	Concordia, Cloud
John E. La Mont, . . . . .	Yutan, <i>Nebraska</i>
Mary S. Lane, . . . . .	McFarland, Wabaunsee
Cora Leichhardt, . . . . .	Wichita, Sedgwick
C. O. Levine, . . . . .	Marysville, Marshall
Erma Locke, . . . . .	Phillipsburg, Phillips
James M. McArthur (2), . . . . .	Walton, Harvey
F. D. McClure, . . . . .	Jewell, Jewell
Vesta McCune, . . . . .	Benton, Butler
Harry McGuire, . . . . .	Valley Falls, Jefferson
Pearl McHenry (3), . . . . .	Paola, Miami
Jessie McKinnie, . . . . .	Beloit, Mitchell
Sadie M. Marvin, . . . . .	Emporia, Lyon
C. S. Miller, . . . . .	Baldwin, Douglas
R. W. Mitchell, . . . . .	Albany, <i>Missouri</i>
J. C. Mohler, . . . . .	Topeka, Shawnee
Robert E. Mohler (2), . . . . .	McPherson, McPherson
Kate E. Moon, . . . . .	Derby, Sedgwick
D. M. Morgan, . . . . .	Kingman, Kingman



CORRESPONDENCE—CREDIT COURSES—*continued.*

<i>Names</i>	<i>Post office (county or state)</i>
Flora H. Morton, . . . . .	Renfrow, <i>Oklahoma</i>
Alex T. Nelson (2), . . . . .	Phoenix, <i>Arizona</i>
Eulalia Nevins (2), . . . . .	Dodge City, <i>Kansas</i>
Charles C. Newton, . . . . .	Wellington, <i>Sumner</i>
Leonard Noll, . . . . .	Ness City, <i>Ness</i>
Melvin B. Norby, . . . . .	Pratt, <i>Pratt</i>
Laura L. Norris, . . . . .	Winkler, <i>Riley</i>
William Nesbit, . . . . .	Lansing, <i>Leavenworth</i>
Guy C. Omer, . . . . .	Paola, <i>Miami</i>
Ray D. Penny, . . . . .	Spencer, <i>Indiana</i>
Clinton A. Perkins (2), . . . . .	Oswego, <i>Labette</i>
T. R. Pharr, . . . . .	Gap Mills, <i>West Virginia</i>
W. E. Phillips, . . . . .	Ashland, <i>Clark</i>
E. C. Rath, . . . . .	Republic, <i>Republic</i>
Harry H. Reeves, . . . . .	Conway Springs, <i>Sumner</i>
Wm. F. Ramsdale (2), . . . . .	Cheney, <i>Sedgwick</i>
W. C. Remstedt, . . . . .	Maplehill, <i>Wabaunsee</i>
Rosa Rich, . . . . .	Cawker City, <i>Mitchell</i>
E. B. Redman, . . . . .	Eureka, <i>Greenwood</i>
F. A. Reider (2), . . . . .	Silver City, <i>New Mexico</i>
John Rieth, . . . . .	Wilsey, <i>Morris</i>
B. H. Rouse, . . . . .	Stockton, <i>Rooks</i>
Mary Robson, . . . . .	Le Roy, <i>Coffey</i>
Philip Schmidt, . . . . .	Goessel, <i>Marion</i>
Gabe Sellers, . . . . .	Great Bend, <i>Barton</i>
E. C. Sherwood, . . . . .	Fort Worth, <i>Texas</i>
Etta V. Sherwood, . . . . .	Clyde, <i>Cloud</i>
Cecil H. Smith, . . . . .	Cruce, <i>Oklahoma</i>
Martin Souders (2), . . . . .	Auburn, <i>Nebraska</i>
L. W. Stricker, . . . . .	Luverne, <i>Minnesota</i>
Lizzie Senecal, . . . . .	Zurich, <i>Rooks</i>
Earl Shaw (2), . . . . .	Phillipsburg, <i>Phillips</i>
F. P. Strickland, jr. (4), . . . . .	Kansas City, <i>Wyandotte</i>
M. Suleyman, . . . . .	St. Paul, <i>Minnesota</i>
Irene Taylor, . . . . .	Chapman, <i>Dickinson</i>
Bart Thayer, . . . . .	Iola, <i>Allen</i>
DeWitt C. Thomas, . . . . .	Wakita, <i>Oklahoma</i>
Rudolph Thompson, . . . . .	Lakin, <i>Kearny</i>
R. W. Titus, . . . . .	Galena, <i>Cherokee</i>
E. H. Todd, . . . . .	Salina, <i>Saline</i>
Katherine Van Noy (2), . . . . .	Lexington, <i>Missouri</i>
George Votaw, . . . . .	Eudora, <i>Douglas</i>
Frank Van Haltern, . . . . .	Winslow, <i>Arkansas</i>
Vernon Walling, . . . . .	Maize, <i>Sedgwick</i>
Earl Walker, . . . . .	Winfield, <i>Cowley</i>
Burt Welsh, . . . . .	Newton, <i>Harvey</i>
Arthur H. Wendt, . . . . .	Inman, <i>McPherson</i>
Amelia Wheeler, . . . . .	Toledo, <i>Iowa</i>
Curt M. Whitney (2), . . . . .	Rossville, <i>Shawnee</i>
John B. Wise, . . . . .	Clearwater, <i>Sedgwick</i>
C. C. Wright, jr., . . . . .	Kansas City, <i>Wyandotte</i>

## Correspondence Course Students—Summary.

## CORRESPONDENCE COURSE STUDENTS—SUMMARY.

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Alfalfa .....	14	Injurious Insects of the Orchard ...	1
Beef Production .....	2	Orcharding .....	12
Breeds of Cattle .....	4	Potato Growing .....	1
Breeds of Horses .....	2	Poultry Culture .....	1
Breeds of Sheep and Swine .....	1	Poultry Disease Prevention .....	4
Canning and Preserving .....	3	Poultry Feeding and Housing .....	16
Care of Children .....	1	Sanitation and Health .....	1
Corn .....	9	Sheep Raising .....	2
Dry-land Farming .....	5	Silos and Silage .....	13
Farm Dairying .....	8	Soils .....	30
Hog Raising .....	11	Sorghum Crops .....	5
Home Decoration .....	3	Stock Feeding .....	10
Household Bacteriology .....	1	Study of Child Life .....	2
Incubating and Brooding .....	5	Tree Planting .....	1
Injurious Insects of the Field .....	3		
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## EXTENSION COURSES.

Animal Breeding .....	12	Highway Construction .....	12
Automobiles .....	19	Home Nursing .....	1
Blacksmithing .....	5	Household Management .....	1
Carpentry and Building .....	11	Insects Injurious to Farm Crops.....	2
Concrete Construction .....	14	Insects Injurious to Orchard Crops..	1
Cookery I .....	18	Landscape Gardening .....	4
Dairy Manufacturing .....	6	Machine Shop Work .....	3
Drawing for Sheet Metal Workers ..	1	Pattern Making .....	1
Elementary Architectural Drawing...	13	Plane Surveying .....	1
Elementary Woodworking .....	2	Plumbing .....	4
Farm Blacksmithing .....	2	Sewing I .....	21
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Farm Forestry .....	1	Soils .....	17
Farm Machinery .....	3	Steam Boilers and Engines .....	5
Farm Woodworking .....	1	Steam Traction Engines .....	10
Gasoline Engines .....	8	Stock Feeding .....	16
Gasoline and Kerosene Traction Engines .....	16	Strength of Materials .....	3
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Algebra I .....	3	History of Education .....	14
Algebra II .....	4	Manual Training Drawing I .....	1
Algebra III .....	2	Medieval History .....	1
Ancient History .....	1	Methods of Teaching .....	9
Animal Breeding .....	6	Modern History I .....	3
Economics .....	5	Modern History II .....	1
Elementary Agriculture .....	30	Philosophy of Education .....	4
English Classics .....	10	Poultry Management .....	5
English Grammar .....	2	Qualitative Analysis .....	1
English Readings .....	1	Rural Sociology .....	1
Farm Crops .....	23	School Law and Management .....	1
Floriculture .....	3	Sociology .....	6
Forage Crops .....	8	The American Nation .....	2
Fruit Growing .....	3	Vegetable Gardening .....	4
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Number enrolled in more than one course .....	94
Number of students enrolled .....	507

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